Better Crops with PLANT FOOD

November 1927 10 cents

The Pocket Book of Agriculture

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Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Managing Editor* SID NOBLE, *Editor*
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VOLUME IX NUMBER SIX

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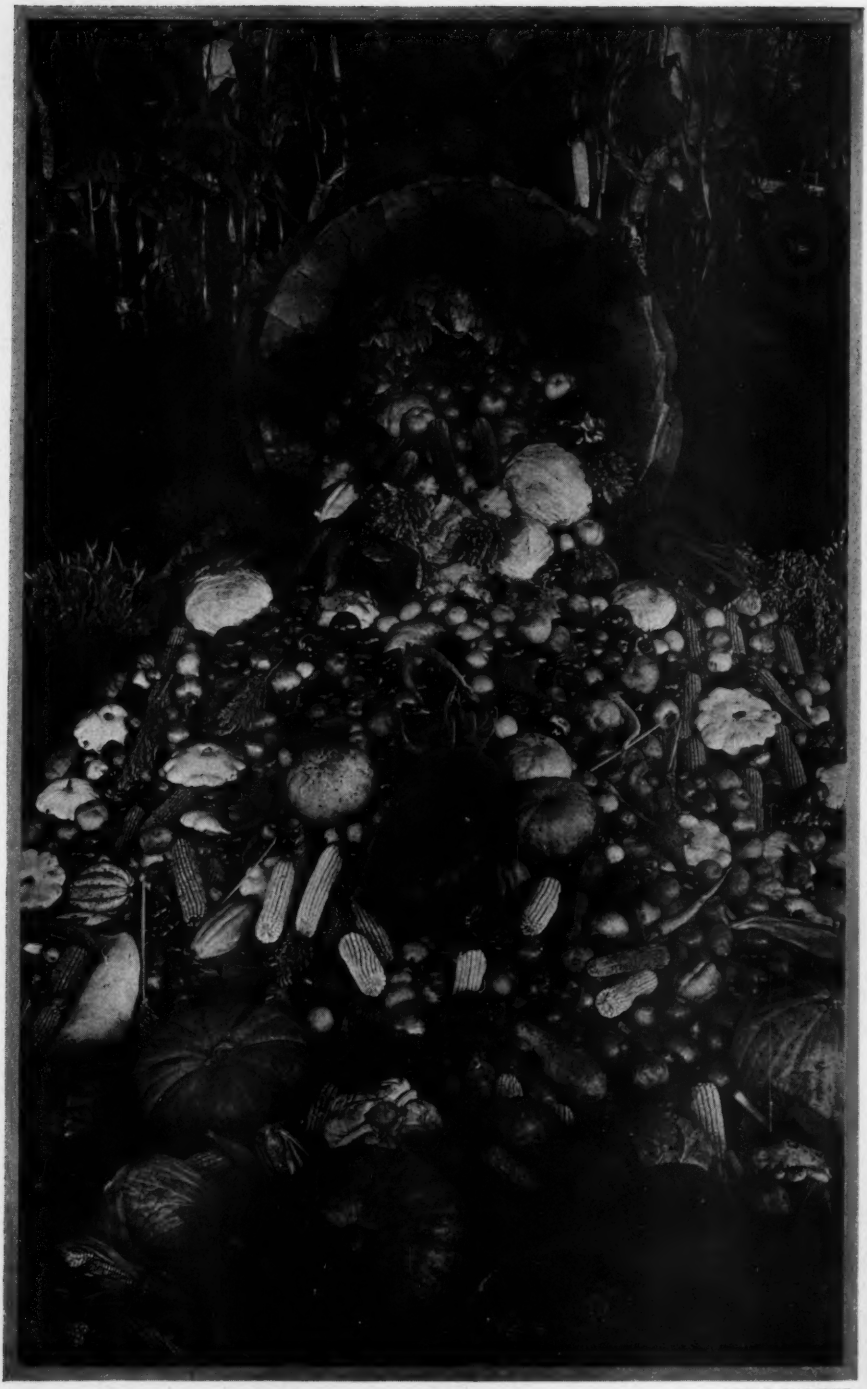

EWING GALLOWAY

Harvest's Horn of Plenty

Better Crops with PLANT FOOD

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NAPOLEON called ingratitude
the greatest weakness of all

Gratitude

By Jeff McDermid

GRATITUDE, like Charity, begins at home, but it needn't stop there. It is natural for many of us fellows to glow with appreciation when the big banker smiles at us, and then completely forget to acknowledge thanks to the modest Home Body who sews on our pants buttons.

I have a neighbor who claims to be one of those automatic, high-geared, self-made mortals. He is proud of the perfection he has attained and the performances he has pulled off, and is very grateful to himself for his brilliant career.

Not in a gossipy sense at all, I let you in for the fact that he has an older brother working on the section, who denied himself an education long enough to help my neighbor get his (with a frat pin to boot.)

Which one of these two cusses himself the most these days I leave you to surmise.

It is apparent from a casual case like this that self-sacrifice and gratitude seldom team together. The world often looks upon them both as weaknesses. The next built-to-sell edition of the dictionary may not carry either of these words in stock as accessories to the human trade.

That self-made neighbor of mine has not attained the fame of Napoleon Buonaparte; neither has he reached the heights of self-esteem and

egotism occupied by the Man from Corsica.

Yet Emil Ludwig says in his book of seven hundred pages something about Napoleon that shows he had a memory for kindness shown him. One of the sublime forms of Napoleon's egotism was his gratitude.

But Napoleon's gratitude was not ordinary kindness, but the pride of a man who feels that he is unique and is determined to overwhelm with benefits anyone who has been useful to him, lest he should possibly remain in the other's debt.

He found sinecures for some of his old school chums who toiled with him at Brienne; he remembered his old associates in his will; and he wrote to Josephine: "As far as I am concerned, I deem ingratitude the greatest weakness anyone can have."

I shall loan my neighbor this book of Ludwig's soon, with a leaf turned down at page 558. It is nearly five years now since I loaned him $3.25. I think maybe after he reads that passage he will take a little interest in the principle of the thing.

IN both its private and public sense, gratitude suffers because there is really so much to be grateful for that a fellow might as well buy a sign "I Thank You" and fasten it to his hat.

Services and benefits and bounties are so common that they make us think of *gratuity* and *gratis* rather than of gratitude. Their common roots are mingled together anyhow and so it's no wonder we take things for granted.

Seldom do we purchase anything complex and mechanical in this machine age until we are sure that prompt service goes along with it.

Seldom do we stay long in the buy-and-buy aisles of a store or enter upon the bye-and-bye installment system until we are certain that the clerks and salesmen are deferential to our smallest whim.

Even my benighted erstwhile friend, Mrs. Plenty Horses, patron of a far-west emporium where I once clerked for a weekly insult, had absorbed the spirit of modernity in merchandising.

She would wobble into the store and beckon me to wait upon her. I would show her everything, from the latest in beads to the oldest in eggs, and exhibit everything saleable under the counter, in the show cases and on the top shelves until quite exhausted. Then I would call for the half-breed interpreter, and Mrs. Plenty Horses would blandly explain, via his stolid indifference, that all she wanted was "a little chewing tobacco and heap service!"

FARMERS complain about the wide disparity between wholesale raw food prices and the H. C. of Luxury at the retail end. When the average woman shopper discards the market basket and uses the telephone to have a cake of yeast and a box of matches delivered in half an hour, what's the answer?

The answer is she gets the consignment in a two-ton truck and the store holds her trade at any cost against fierce competition.

More two-ton trucks at the producing end and more market baskets

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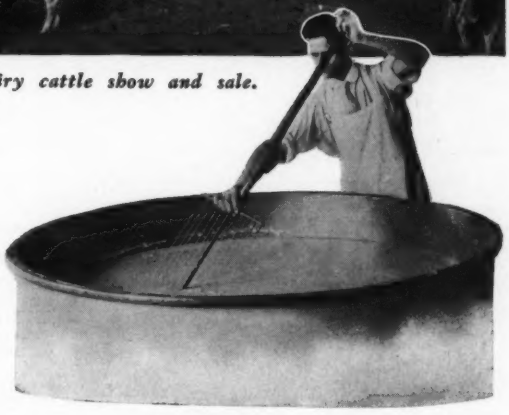
Federal and State accredited dairy cattle show and sale.

Where HOME Dollars *do* Home Work



One of the steps in cheese-making.

By William J. Maddox

A DOZEN years ago Grove City was just a sleepy little western Pennsylvania town. Whatever its bid for fame, it was certainly not as a dairying region. The few pastures about the town furnished little more than an athletic field for a nondescript handful of cows.

Years before, a creamery had been started, only to languish out a brief existence. Then came a cheese factory, which ended up in the hands of the sheriff.

It was no exception among small towns.

There was the usual Chinese Wall of suspicion and prejudice between the townspeople and the country folk. Every spring and fall the rural carrier cussed his load of mail-order catalogues. And what cash the bank didn't lend out "on proper conditions" —which virtually eliminated the farmer from getting any of it—was sent off to the big city for investment.

Now, it happened that about that time—1914, to be exact—the U. S. Department of Agriculture was looking for a creamery where it could try out under actual commercial con-

ditions methods that seemed pretty good in its laboratories. A number of localities were studied.

Now, it happened, too, that in Grove City were a handful of business men who had vision enough to see over this Chinese Wall. There were a carriage manufacturer, a banker, a shoe dealer, a real estate man, a broom manufacturer—a varied assortment. They got wind of the government's quest.

"We are not much on dairying," they told the government experts, "but we're willing. And if cooperation will do it, don't look any farther."

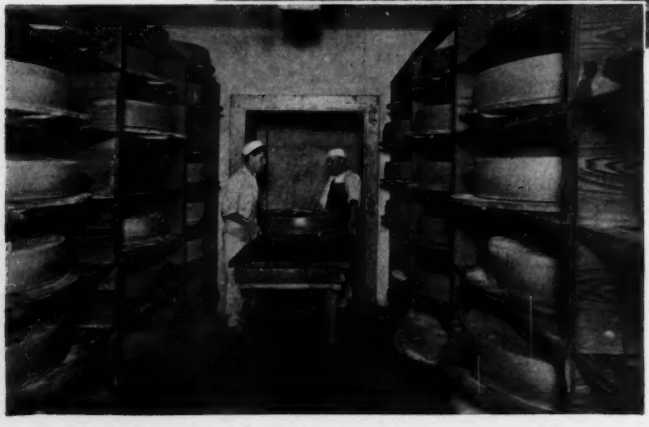
Negotiations were entered into and a contract soon drawn up. Grove City was to finance the enterprise and supply the business management. In return the creamery would have the benefit of its official connection with the U. S. Department of Agriculture, insuring the best of markets for its products. This was not to be used in advertising, though, or in any way to the prejudice of competitors.

One of the stipulations made by the department was that the creamery would not be a dividend-profit proposition. Both sides were embarked upon the development of a community, not creating a good investment for a few lucky stockholders. And the Grove City men saw the advantage of this.

A Stock Company

The result is that the Grove City Creamery, incorporated under the laws of Pennsylvania, is a stock company with a cooperative feature. After a rate of dividend, fixed by the agreement between the creamery and the department, is paid, the profits are returned to the farmers in proportion to the amount each has brought in during the year.

The initial plans were modest. They called for a $12,000 building. The fund was way oversubscribed,



The creamery at Grove City that has brought prosperity to the entire countryside.

Left: Swiss cheese curing. Scientists have found what makes the holes, and, incidentally, the flavor.

and instead a $32,000 plant was erected.

May 3, 1915, the creamery opened for business. Its success has been little short of spectacular. In 12 years Grove City has become one of the model dairying communities of the country, if not the world. Its methods have been widely studied and copied. At least eight similar communities have been developed in Pennsylvania alone. They, of course, do not have the same direct contact with the Federal department.

From the department's point of view one such experiment station for carrying out its research work under real commercial conditions was enough, and it has been forced to turn down numerous offers of other controlled creameries in various parts of the country. But as far as actual methods are concerned, whatever is learned at Grove City is made available for them to put into practice.

Presenting the bank's silver trophy for first honors in livestock judging.

Grove City today is more than a town. It is a community. And when you speak of it you mean the whole countryside for 10 miles around in every direction. Farmers and merchants carry on in excellent cooperation. They find it pays in more ways than one. Farmers now belong to the Commercial Club, and they take an active part in all projects for community betterment.

The fact that the creamery is managed by the department probably gives it no appreciable financial advantage. The relationship is investigational and has not reduced the cost of manufacture of its products below that of other creameries. The products are always sold on their merit, the name of the department not being used to advertise them.

Under the guidance of the department, the creamery has been something of a pioneer in introducing the public to the merits of sweet-cream butter. As a result its butter sells at a premium of from three to seven cents a pound over the usual New York quotations. The butter has proved so popular that it has been found impossible to meet the demand. A special trade takes practically the entire output.

A Success from the Start

From the start the creamery has been a success. The first distribution among the farmers amounted to $25,000. The next year this was more than quadrupled. Since then, each year it has increased steadily until now nearly half a million dollars a year in cash of the new wealth created goes back to the farmers.

In 1919, it was found necessary

to enlarge the plant. A $60,000 addition was built. Already this has been outgrown and further extensions will have to be made.

Butter is not the only money-maker. Its Swiss cheese is shipped to many parts of the country, some even going to Switzerland itself. New York is a good customer, as well as St. Louis, Kansas City, and Omaha. Some goes as far west as Los Angeles.

A creamery field man is employed by the department to assist in bringing about local dairy development. The chief purpose in attempting this work is to determine whether such dairy development will justify the cost, and whether it is advisable for other creameries to employ a field man. The department admits that it is difficult to measure such work in dollars, but it believes that it is largely through the influence of the field man that dairying has been able to build up the Grove City community.

When the field man first made his appearance in Grove City, most of the farmers looked on cows as just cows. Even the names of the great dairy breeds were almost unknown to many of them. Now they can talk blood-line with the best.

Carloads of Purebreds

The field man's first step was to confer with the cashier of one of the banks, a man who had taken a keen interest in the project from the start. The upshot of their talk was that the bank agreed to buy carloads of approved purebred dairy cows, ship them in at its own risk to Grove City, and sell them to the farmers at cost, the farmers to draw lots for choice of animals. During the first few years of operation the bank brought in eight carloads of purebreds. It reports that it has not lost a cent on any of the transactions.

In every instance the demand has been more than the number of animals imported. And all this was done in a district where dairying had never been a success and among people who before would not have raised money to purchase a purebred animal of any kind.

The bank did not stop there. It helped the farmers in many other ways. When the success of bringing in purebred cows had been proved, the bank financed the purchase of purebred bulls and took a leading part in organizing three breeders' associations—four bulls for each association.

If the community development is to be a permanent thing, the younger generation must be interested. Accordingly a boys' and girls' purebred cattle association was the next step in the bank's program. It financed the purchase of purebred calves for the boys and girls.

At the same time, and under the leadership of the bank also, cow-testing associations were formed and the work of culling out the slackers was undertaken. As soon as the association proves that a cow is unprofitable she is disposed of and a better cow is purchased to take her place.

One farmer found that nine of his eleven cows were unprofitable. He immediately sent all nine to the block and began buying better ones to take their places.

One of the most effective organizations introduced into the community is the accredited herd and sales association. The herds of all members are tested for tuberculosis and accredited accordingly. As a result the Grove City herds have been brought up to such a high standard that they now constitute more than half of all the accredited herds in the state.

Each year Grove City has its dairy show. The bank provides prizes, and everything is done to make the show the dairy event of that part of Pennsylvania.

In the wake of the prosperity that has come to the community generally through the success of the creamery are the thrift clubs organ-

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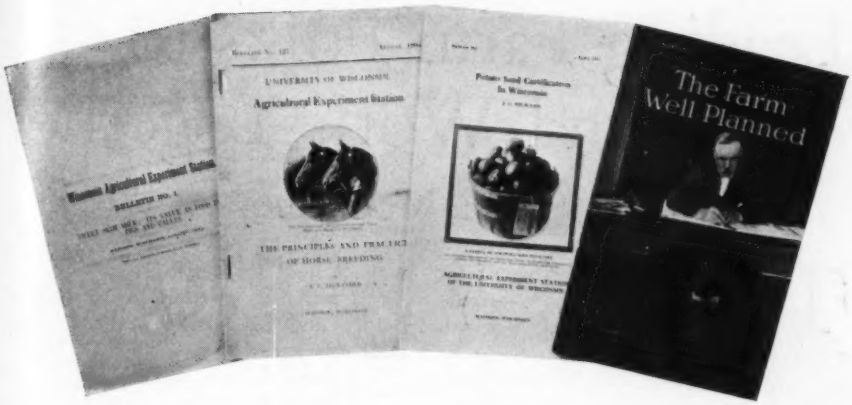
UNIVERSITY OF WISCONSIN
Agricultural Experiment Station
THE PRINCIPLES AND PRACTICE OF HORSE BREEDING
The Farm Well Planned

The Bulletin

By John Fitzpatrick

APPEARANCES do not make a farm bulletin, but they do help to get it across to the farmer public. Farm folk, as well as other people, are attracted by appealing front covers on the numerous publications that enter their homes.

Time was when the front cover of farm bulletins and circulars did little more than advertise the institutions. Across the upper and middle portion of the majority of front pages appeared the name of the institution, in large bold face type, and below it was the author's name likewise set in conspicuous display. Then, tucked obscurely down near the bottom of the page, the title, set in small type, would peep out. This presentation undoubtedly made the farmer better acquainted with the institution, but it was not the most productive method of arousing interest in the pamphlets' contents. So subordinated was the title that many readers instinctively felt that the reading matter would prove uninteresting even though they knew it was important.

Some of the early bulletins had illustrated covers but, for the most part, the pictures did not portray that action or human interest that is now considered so necessary.

Another characteristic of the bulletins of yesterday was that they were written over the heads of their farmer audience. Written in scientific phraseology they were not comprehensible to the men of the plow and furrow for whom they were prepared. Some of them seem to have been written with a distinct take-it-or-leave-it attitude. This was unfortunate, for while these bulletins were just as valuable as the present day publications, their unfortunate method of presentation caused them to fail to get the attention they rightly deserved.

The Show Room

Today the front cover, as the show room of the bulletin, has been decorated. Because of so much free literature, such as catalogs and other commercial booklets that go daily to the rural homes dressed in attractive covers, the farm bulletin faces competi-

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Leading Farm Folks to Play and Work Together

By H. E. McCartney

THROUGH the leadership of H. S. Benson, County Agricultural Agent, there was an average attendance of 367 farm folks at 190 meetings held in Knox county, Indiana, last year. These were strictly rural community gatherings, held in the consolidated schools or in the rural churches of the county. Prior to the coming of Benson to the county, three years ago, the attendance seldom exceeded 30 or 40 when an attempt was made to get the folks of the country districts together.

In his work Benson has changed the whole attitude of the people of his county toward rural life and has set them to work at solving the problems that confront them as residents of a rural district. He has carried on his work of rural leadership with the idea that he could best help the people by leading them to help themselves. One of his first acts was to call together a selected group of prospective rural leaders. People who came to this preliminary meeting stated emphatically that it was a hopeless task to try to accomplish anything in the country in the way of holding meetings.

"It has been tried in Knox county before and has always failed," they said.

To these Benson replied:

"If we will prepare programs that are interesting, people will come. If they do not attend, we are to blame in not making the evening's entertainment attractive."

His logic won and plans were drawn up for the preparation of programs calculated to be interesting and attractive.

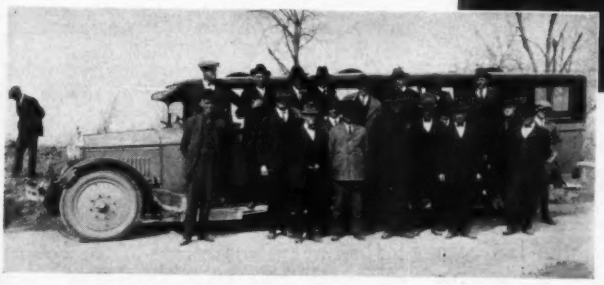
A Program for Each Township

The plan as devised and developed under Benson's leadership is for the people of each of the 13 townships to prepare one program each year. This is put on, first, in the home township at its regular monthly meeting. Then, after the manner of an old-fashioned

Above: A group of Knox county, Indiana, farmers ready to start the evening's entertainment.
Left: The championship farmers' basket ball team, of Knox county, representing the Palmyra township.

traveling show troupe making one night stands, the entertainment is taken to the other townships. Saturday and Sunday nights are omitted, but otherwise the performance is given nightly until the county has been covered. The entire circuit is completed in less than three weeks. Then at the beginning of the succeeding month the next township in order starts on its pleasant task of furnishing the talent for a series of meetings.

The people have become so much interested in their meetings that no condition of weather or other circumstance can keep them at home. Excuses that were quite sufficient in the old days are now laughed into the discard.



Above: H. S. Benson, county agent, Knox county.

Left: A group of farmers ready to start a tour through a neighboring county.

A few months ago, a prominent man went to the county for the purpose of studying Benson's system at first hand. It happened to be rainy when his train arrived at noon. A downpour continued through the afternoon. As the time approached to drive to the country for the meeting, he gave up all hope of seeing a typical Knox county community meeting until another day. In disappointment he said to Benson, "How shall we spend the evening?" Benson replied, "We shall go to the country just as we had planned." Arriving at the consolidated school they found that a crowd of 400 had already assembled. During that same month there was an average of 322 at each of the 13 meetings in spite of the fact that nine of the meeting nights were rainy.

Benson's plan of developing the programs has called for the use of the best talent in each township. It has caused careful search to be made for the most suitable plays and for the best ideas in entertainment. It has required strenuous training on the part of those who had parts to perform. Yet those who have had the privilege of taking part are always eager to do so again. They say that the training and experience they receive more than repays for their time and effort. Last year, 260 farm folks had an active part in putting on these entertainments.

Variety of Entertainment

The variety on the programs is limited only by the number of opportunities. A home talent play is proving to be just as "taking" as it was in the days of the country literary society. A minstrel show is ever one of the most attractive forms of entertainment. No season passes in Knox

county without one or more programs of this character being staged. Musical numbers are popular with these progressive rural folks. Some of the townships have developed orchestras. Others have put on special numbers either instrumental or vocal. Novelty features find a prominent place on the programs. One month a broomstick fiddle skillfully manipulated by a local artist was a star attraction. On another program a cartoon sketch set up by a local man created unusual interest. Whatever the nature of the entertainment, the fact that home folks or the friends and neighbors from another part of the county are giving it is sufficient attraction to draw a crowd.

The evening is not all devoted to entertainment. Usually an hour or so is spent considering the many items of business that may properly come before a community in its Farm Bureau organization. Then comes a short address by some local person who has prepared something worth while, or by some person of note who has been brought to the county to be the speaker.

As a climax to all the gatherings of the year, Benson staged a county farmers' picnic. This was held at Vincennes, the county seat. This little city is the location of the capital of the old Northwest Territory. The crowd of farm folks assembled that day required 3,000 autos to bring them to town. The parade that wended its way through the streets of Vincennes was something never to be forgotten by those who saw it. In its line were floats, pantomimes, and miniature pageants representing a wide variety of subjects. Some of these were log cabins; the rail splitting age; old methods of farming vs. modern methods; spinning cloth from home-carded wool, grandfather going to mill; fashions of 1808 compared with those of 1925; Goddess of Liberty; signers of '76; and many others of local and general interest. Each had been worked out by the farm folks under Benson's leadership and direction.

Athletic Events Prominent

Development along many other lines has come as a result of the splendid spirit generated at the monthly township meetings. Athletic events have come to be prominent features. Interest reaches a high pitch when the winning team in baseball or basketball from the south half of the county plays the best team from the north half for the county championship.

Projects of a practical nature have seen a wonderful development since the people began to get together in their community meetings. These projects have included production and marketing and work connected with the home. Camps for boy and girl club members have been held with most remarkable success. It would seem that, in getting together at the meetings and in working together to make their meetings successful, the people have learned to play together and to work together on any project that may be helpful to the country or its farm folks.

Benson is modest in his claims for personal

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A meeting of Knox County nutrition project leaders.

The Fertilizer Outlook

Agricultural and Scientific Bureau

N. V. Potash Export My.

FERTILIZER consumption in 1928 will probably be greater than in 1927, though the outlook is not uniform. The present high cotton prices indicate a big increase in tonnage in the eastern part of the cotton belt. Tobacco and potato prices, however, over the country as a whole, tend towards a decreased tonnage, offsetting to some extent the probable increase due to cotton. The farmer pays his fertilizer bill with the money which he receives for his crops. When the production of a crop is profitable, there is a tendency for farmers to expand the acreage and use more intensive methods of production, such as more fertilizer, better seed, and more cultivation. When the production of a crop is unprofitable, the opposite is true; farmers plant a smaller acreage and adopt less intensive methods of production. They use less fertilizer.

This general fact is well known. Its major importance has been proved in detail by a study of factors affecting fertilizer consumption. During the 15-year period, 1900-1914, the fertilizer tonnage sold in the United States increased almost without interruption. In only one year during that time, 1912, did the tonnage decrease from the preceding year.

The value per acre of cotton increased during this period. The trend in fertilizer tonnage also increased. There was general agricultural prosperity. It is true that there was an upward trend in the general price level, that is, in the price of the things farmers bought. The prices of farm products, however, tended to increase slightly faster than the general price level. Farmers as a class were prosperous and fertilizer consumption increased.

In contrast with this, the fertilizer tonnage has fluctuated much more violently during the 14 years, 1914-1927, and there has been practically no general upward trend. In 1915, the tonnage was 1,800,000 tons less than in 1914. In 1921, the tonnage was 2,400,000 tons less than in 1920. In 1927, there was a marked decline in tonnage.

In 1914, the value per acre of cotton declined. This was followed by the decline in tonnage in 1915. Cotton declined in 1920. The tonnage declined in 1921. A change in the value per acre of cotton is an important factor in causing changes in fertilizer tonnage. These violent fluctuations in tonnage are also one of the chief causes of losses in the fertilizer trade.

The value per acre of tobacco and potatoes also have an important influence on fertilizer consumption. During the past 25 years when the December 1 value per acre of cotton increased one per cent over the preceding year, the fertilizer tonnage increased about 0.4 of one per cent. A one per cent change in the value per acre of tobacco caused a 0.3 of one per cent change in the fertilizer tonnage.

The three parts of the fertilizer problem are—increase in consumption, stabilization, and adjustment to inevitable conditions. The immediate outlook, therefore, has some practical significance.

Discussing the eight cotton states first, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Arkansas, and Texas, the October

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COTTON LINTERS

$22,000,000 Crop Developed Within Twenty-two Years

By C. B. Sherman
U. S. Department of Agriculture

COTTON linters constitute a crop which has developed entirely within this quarter century, yet its value has reached $22,000,000 during some recent years. As a matter of fact the crop became important only when the World War demand for munitions made it worth while for the oil mills to produce linters in quantity. Until that time linters were considered an unimportant by-product only.

Between 1890 and 1900 there was a saying in the oil business that there was a fortune in store for the man who would invent a means of cleaning the lint from Upland cotton seed so that it would have the appearance of Sea Island or Egyptian seed. Several delinting machines have been invented since that time and the problem has been solved.

With the exception of Sea Island and Egyptian cotton, seed of all cultivated varieties of cotton bear two commercial types of fibers on their seed coats—a fiber that is suitable for spinning purposes and a short fiber or fuzz that is closely matted about the seed. Fiber of the first type is removed and baled at the gins and constitutes the cotton of commerce. It is the other type, or fuzz, together with any of the first type that may escape removal at the gins, that is removed by a second process usually performed at the oil mills in the cleaning and preparation of the seed for crushing, that constitutes our crop of linters.

Crop and Prices Variable

Commercial values of linters naturally vary from time to time, but it is an interesting fact that they do not commonly follow the fluctuations in the cotton market. Nor does the size of the linter crop depend very largely upon the size of the cotton crop. The delinting is so arranged that supply is adjusted rather well to demand.

Uses for linters are varied and the chief products from their use are the opposite ones of explosives and mattresses. The proportions of the crop going into the one manufacture or the other naturally varies with the times. During the World War the Cotton and Cotton Linters Section of the War Industries Board ruled that after May 1, 1918, all linters should be cut to the munition type, running 145 pounds and upwards to a ton of seed crushed. The same regulation fixed the price at 4.67 cents a pound and provided that linters be sold only to the company that acted as purchaser and agent for the Ordnance Department. But the Ordnance Department was a good customer and under its demand the crop reached its peak of more than a million bales valued at more than forty-five million dollars:

For a while after the war, interest in linters fell off precipitously and the crop decreased to something like 422,000 bales, worth only about three and a half million dollars. Recently, however, interest has increased again, the mattress and allied industries are active in the market, and the crop is again an important and valuable one.

Standardizing Grades of Linters

When the Government commandeered all linters, a great deal of difficulty was experienced, in many quarters, in establishing values for the

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200 pounds per acre of 2-8-16 fertilizer made this difference.

HUNGRY SOILS

By C. J. Chapman

Wisconsin College of Agriculture

TO know what to recommend when a farmer asks the question, "What fertilizer shall I use?" is not always easy, but Robert Amundson, county agent of Outagamie county, Wisconsin, has so thoroughly familiarized himself with the soils of his county and their requirements that he comes pretty close to hitting the bull's eye in answering such questions.

It has been recognized for some time that in general the soils of the northeastern counties in Wisconsin are very deficient in phosphorus and almost unbelievable results have been secured through the use of acid phosphate on these upland phosphate-hungry soils. Yet it is only within the last two or three years that the evidence of potash hunger has manifested itself on certain soil areas within this northeastern portion of the state.

Mr. Amundson has made some close observations, and at the same time has carried on some simple tests by which he has learned of the need for potassium. It was noted that wherever wood ashes were used on these peculiar soils that striking differences in the growth of all crops resulted. Tests for acidity on these soils which responded in such a marked way indicated that most of them were well

supplied with lime. This led to the conclusion that it was the potash of the wood ashes which was responsible for these striking differences.

Subsequent trials with commercial fertilizers high in potash compared with straight acid phosphate conclusively showed that it was the potash which was chiefly needed on these particular soils.

The characteristic soils of this area which show such marked response to potash are the dark, fine sandy and silt loams on the more level or gently rolling areas within this district. The western portion of Outagamie county includes thousands of acres of these soils. While we have always recognized the need for potash on the black muck, peat, and border marsh soils in this state and have more recently learned that a large percentage of the sandy soils in the central portion of the state are deficient in potash, yet the fine sandy and silt loams were never suspected of being low in their content of available potassium.

Soils Meetings

The texture and structure of the soil are excellent, and for the most part it is well supplied with organic matter and very retentive of moisture. For the first few years after it is brought under cultivation this soil is fairly productive. The meager supply of potash has been kept in circulation to some extent through the return of manure, and dairy farmers have been able to grow fairly good crops on this land since most all crops grown were fed and manure returned to the land. A large portion of this type of soil is now under cultivation.

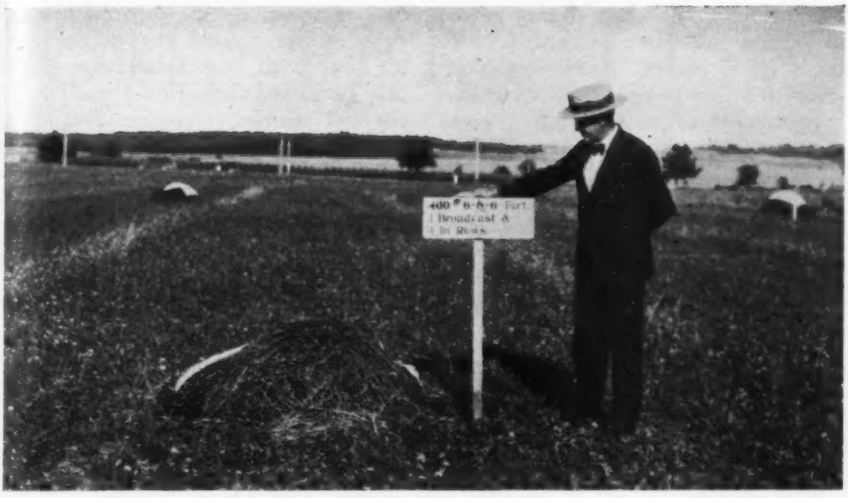
While the water table is fairly high, the drainage is good except in excessive wet seasons. There is some relief to the country, in fact in some places the land is quite rolling. These soils are mostly terrace formations or glacial outwash plains. The introduction of cabbage and potatoes within the past few yeaers has tended to accentuate this need for potash.

Mr. Amundson has used all the information available in diagnosing the ills of the soils of his county. He has not only made a detailed study of the soils report and soils map of Outagamie county, but has dug up all of the records of chemical analyses made on soil samples in his county. It has been found that in general the total potassium in this type of soil is from 10,000 to 15,000 pounds per acre less than on the heavy clay soils of the eastern portion of the county.

Mr. Amundson has worked out a unique mail order system in his study of the soils of his county. Mailing tubes containing small aluminum cups together with a question blank are sent out to the farmers, and the samples of soil sent in are not only tested for acidity, but observations are made as to the texture and structure and the farms from which they were taken are located on the soils map. The information contained on the question blank is used as a supplement to the other information secured in making the final recommendations to his farmers, and Mr. Amundson has been able to hit with great accuracy in his recommendations to farmers of his county.

Not only has Mr. Amundson made a close study of the soils of his county on his own initiative, but he has always kept in close contact with the College. He has used the services of the Extension agencies to the fullest extent. It has been the privilege of the writer to accompany Mr. Amundson and groups of farmers on farm tours throughout the county during the last two summers. This last winter we held soils meetings in practically every important center in the county.

While potash has been the chief limiting element on these peculiar sandy and silt loams in the western part of the county, yet phosphates are needed in addition to potash for best results on these soils. The 0-12-12, 0-14-14, 0-8-24, and 0-9-27 are the mixtures chiefly used for the general crops,



Showing the residual benefit of potash to the clover crop at the Branch Experiment Station, Hancock. Total amount of fertilizer in rotation is 400 lbs. per acre, all applied to the corn crop ½ in hill and ½ broadcast. Above 6-8-0, below, 0-8-6. Both corn and small grain show the same differences as noted here on the clover crop.

while mixtures such as the 3-12-12, 2-8-16 and other combinations containing some nitrogen are used for corn and special truck crops where some nitrogen is required.

The red clays, silt loams, and certain of the lighter textured soils in the eastern portion of the county respond chiefly to phosphates. The eastern half of Outagamie county includes large areas of these phosphate deficient soils, and results with phosphate fertilizers here are frequently as striking as in Marinette and Door counties of this state. Mr. Amundson has learned that there is no one blanket recommendation which will cover the requirements of all the soils of his county.

In general the upland soils of Wisconsin need phosphates and lime, and we stress the importance of the lime and phosphates in a fundamental soil-

building program. But county agents in general must not be content with these more general recommendations since there are wide variations in the requirements of soils within a given area. When making recommendations to farmers several factors should be considered such as the type of soil, the length of time under cultivation, the system of farming practiced, the amounts of manure used, the kind of crops to be grown, the topography of the land, the drainage, etc.

Influence of Agent

The soil and crop departments of the various experiment stations and colleges throughout the country are conducting many experiments on their more important soil types and soil areas, yet it is impossible to apply the findings of the experiment stations to every farm, even where the soil type is the same. The county agent must familiarize himself with the soils of his county. The extension specialist of the experiment station and college renders a valuable service but is limited in the time he can give to the individual county agent.

In addition to the help offered by branch experiment stations and soil specialists, we have here in Wisconsin a service known as the State Soils Laboratory through which farmers may secure help in solving their soil problems. This service includes an inspection of the farm by a representative of the Soil Department of the University who takes his own soil samples and then makes analyses for total nitrogen, total and available phosphorus, potash, and acidity.

Information as to the type of soil, topography of the land, length of time under cultivation, and the system of farming practiced, is secured first-handed by the soil specialist at the time of examining the farm, and a close contact with the farm and the problems of the farmer is thereby established. In the final report to the farmer, based on the information secured when making the examination together with additional help which may be gained through the analyses of the soil samples, recommendations as to the lime and fertilizer requirements of the soil are made, and a fundamental program of soil and crop management which will be a guide to the farmer in future operations is laid down.

More than 3,600 farms have been examined through this State Soils Laboratory service, and the information gained has been of great value to the county agent in his more general knowledge of soil conditions in his county.

We also have in Wisconsin an organization known as the Wisconsin Soil Improvement Association, with local county orders affiliated with the state organization. The county agent acts as the local secretary for his particular county. Through this association farmers can secure help and advice direct from the soil specialist of the College. Members are entitled to free tests of soil samples both for acidity and available phosphorus, and reports to the farmers are based not only on the tests made on soil samples but on information supplied through the questionnaires which the farmers fill out and which accompany soil samples.

The bulletins and circulars by the College all help the county agent, but in the final analysis the influence of the agent in his county is of greater value than all of these outside agencies. He has within his county the Smith-Hughes high school and other agricultural institutions through which he works. In fact the rural school teachers can, and frequently do, cooperate in projects pertaining to the fertility of the soil. In other words the county agent should be the hub around which all of these other agencies revolve. He has a wonderful opportunity for service to the farmers of his county through demonstrations,

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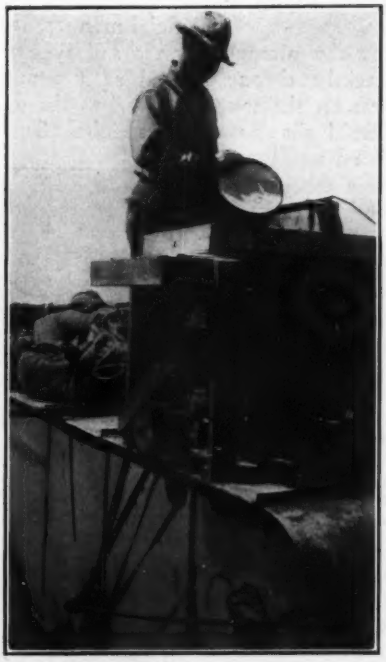
SOIL FERTILITY
for Business Reasons

By W. A. Albrecht

University of Missouri

BETTER CROPS WITH PLANT FOOD is not only a magazine title, but is the chief business principle in the mind of Eugene M. Poirot when it comes to managing an 1,840-acre farm in Lawrence county of Missouri.

To take over an extensive tract in 1921 when agriculture was riding the toboggan toward depression, demanded a rather specific and reliable policy and gave no room for panaceas or wildcat ideas. Realizing that he was undertaking no kid's job, but a cold business proposition that had to pay, Mr. Poirot hitched himself to the idea that proper management of the soil fertility would be his main control of economic production. He thought that if he used his soil as a factory for converting crude plant foods into high yields of marketable finished products, economic returns on the business would be possible.



Starting wheat straw on the road to artificial manure by applying chemicals for process through the thresher.

That his principles have been properly chosen is indicated by his success in growing legumes on land where they were almost unknown, by his crop yields which have been steadily increasing, and by the farm's cash returns which have almost doubled.

For the raw materials or the soil fertility out of which to grow his crops, Mr. Poirot does not confine himself to his own farm, but uses purchased plant foods. There is no hesitation to invest in these provided they return the investment with a profit.

"Economy," he says, "does not consist in refusing to spend money, but in spending it where it comes back with largest profit."

So far, his purchased plant foods have been only nitrogen and phosphorus, with attention to organic matter as barnyard, artificial or syn-

The wheat above was fertilized with acid phosphate and limestone.

thetic, and green manures as a means of making the ample soil supply of potash available.

On the Poirot farms the nitrogen problem is handled mainly through legumes. To grow these on the sour, flat, tight-subsoiled Gerald silt loam, making up the farm, is no small task; but they are being grown through the use of limestone, acid phosphate, and manure. All of these go on the wheat nurse crop for the legume, the limestone much in advance of, the phosphate at the time of, and the manure a few months after the wheat seeding.

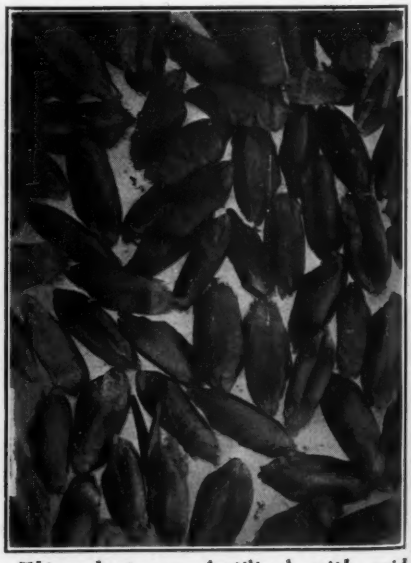
Rots Straw Quickly

"Manure making for such extensive farming is impossible" you will say, and truly so in most instances, but Mr. Poirot is working on the farm possibility of converting his wheat straw from one crop into artificial or synthetic manure—by methods suggested by the English process—to have it ready as a winter top-dressing for the next crop. By this method, he puts commercial nitrogen together with other chemicals into the straw to rot it down to manure quickly, and at the same time to add this purchased plant food to his wheat and clover.

His experience during the past year, under the guidance of the Missouri Agricultural Experiment Station, led him to believe that for every acre of wheat grown one year he can manure one-half acre of wheat the next year, and not only improve the quality of the wheat, but spell the difference between success and failure in the legume crop following. The artificial manure seems to be the final boost in the legume problem on this soil type.

The use of lime and acid phosphate, commonly considered as the last words in growing legumes, are not the whole requisite. The top-dressing, with the synthetic manure, most any time in winter from December to February, gets the stand by furnishing covering for the seeds and small plants during the late winter and by supplying readily usable plant food at the time when the other treatments fail.

Mr. Poirot's success with the artificial manure, and his stand of legumes on a soil type not commonly considered as a legume possibility, were a marvel to the soil scientists of the International Soils Congress excursion



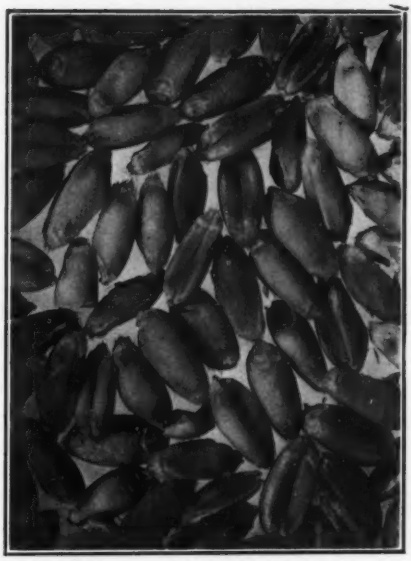
This wheat was fertilized with acid phosphate, limestone, and straw.

who recently paid the farm a visit. Mr. Poirot is going ahead with the synthetic manure idea. He has a simplified machine for putting the chemicals into the straw pile directly through the thresher, and making the piles so that the rainfall does the final job. With normal rainfall he is able to use the process regularly to make his straw pile carry commercial nitrogen as top-dressing to the wheat, to make his commercial nitrogen hustle the wheat straw, ordinarily wasted, back to the land in the form of manure.

Recognizes Deficiencies

Both of these fertility contributions serve to get an excellent legume stand for feed or soil improvement purposes. With successful legume stands gathering free air nitrogen, with the return of the straw, and with applications of commercial nitrogen, the problem of soil maintenance with respect to this element is solved.

For phosphate up-keep, an application of 200 pounds of 20 per cent acid phosphate on the wheat is the practice. In a four-year rotation, such a treatment will not entirely maintain the phosphorus of the soil. However, with prompt return of the wheat straw, through artificial manure, the shortage in phosphorus can almost be offset. For this purpose Mr. Poirot is carefully observing the experiment station projects on corn fertilization and is about to adopt phosphate treatment for his corn that goes on to the legume sods with decided improvement in the crop as a result of this cropping sequence. Under such a scheme, the farm factory can be kept running without lowering its stock of raw material.



This wheat was fertilized with acid phosphate, limestone, and artificial manure. Photographs enlarged 3.4 times.

Alsike clover after wheat fertilized with artificial manure.

Soil fertility is Mr. Poirot's business thinking, largely because he recognized at the outset the handicap in the soil type he farms. Quite contrary to many, he recognizes the deficiencies of his land rather than extols its virtues, and aims to make the most of it. His thinking bears fruit in a prolific outlay of ideas, none of which, however, endanger the credit side of the business through hasty or premature adoption of farm practices. They must first receive the careful scrutiny

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Postponing HUNGER

By T. K. Wolfe

Virginia Agricultural Experiment Station

THE farmers of the United States have passed through and are still passing through, but with finer adjustments than formerly, an agricultural depression that has sorely tried their souls as well as their purses. There are many who wish to help the farmer and rush to his rescue, but usually the results are unsatisfactory from his standpoint.

Too frequently, especially in case of farm legislation, those who have the power do not have the knowledge and those who have the knowledge do not have the power to be of material service. Some think the farmer should be allowed to work out his own salvation unaided and unhampered by governmental influences; others believe he should receive considerable nursing from the financial breasts of the nation. Since the fruits of farming are of nation-wide concern, it seems that the agricultural ship should be steered through a middle course and the farmer aided to some extent so that he can work out his own salvation more easily.

Added to his problem of self-support, the farmer is faced with the problem of feeding our rapidly increasing population. It has been shown by eminent biologists that our population is increasing more rapidly than our food supply. However, the farmer will probably look askance at the problem of raising more food to feed a rapidly increasing population when he cannot sell, at a reasonable profit, the crops he now produces.

Too frequently the farmer's profit is due to a short crop in this country or in foreign countries, or everywhere. Frequently, so frequently that it is the rule rather than the exception, the farmer realizes more actual profit from a small crop than from a large one. Such existing conditions will not stimulate our farmers to increase production to feed our increasing population. Today the farmer is more concerned with disposing of agricultural products at a fair profit than he is with increasing production to feed an increased population 100 years from now.

Economical Production

If there is anything in the statement that "charity begins at home," the farmer can be justified to some extent in this attitude. If some way can be devised whereby the farmer of today can obtain more remunerative returns, our population of the future will be fed much better than if nothing is done to help the farmer at present. The agricultural situation can be greatly helped by the more economical production of farm products.

Our population—present and future—must be fed. No one will attempt to refute this statement. It is a settled fact that more and more foodstuffs will be consumed from year to year. But the farmer has found, to his sorrow, that a general high production has too often meant low prices. On the other hand, high yields per acre, within limits, are more economical than low acre yields. In other words, for most economical production and for increase in our food supply, the farmer must produce more per acre than he is now producing. It is common knowledge that the farmer whose acre yields are well above the average for the country

usually makes a profit even when prices are low, and makes greater profits when prices are high. *General high production may mean lower profits, but individual high production, within limits, always means greater profits.*

There are many factors which may influence the acre yields of crops. Among these may be mentioned crop rotation; control of insect pests and diseases; use of fertilizers; the addition of organic matter to the soil in the form of stable manure, green manures, and crop residues; better use of irrigation water; the use of good seed; and improved adapted plants. The factor of improved adapted plants in its relation to the food supply and population increase is worthy of serious consideration.

A number of plant improvements of great importance have been accomplished by plant breeders. A new variety of wheat has been developed and recently distributed by the Cornell University Experiment Station under the name of Forward. This wheat is immune to loose smut, which frequently causes great losses in wheat. In 1924 loose smut alone reduced the yield of wheat 9,800,000 bushels, an amount sufficient to furnish wheat bread for 1,750,000 people for one year on the basis of our average per capita consumption. The production of this variety indicates the possibility of the production of varieties with the same characteristic for all the wheat growing sections of the country.

Immune to Smut

A variety of oats known as Markton has been developed by the United States Department of Agriculture, and it is an outstanding variety because it is immune to covered smut. The smuts of oats annually cause a loss of approximately 50,000,000 bushels of oats, much of which loss is due to the covered smut. The Markton variety yields well, and it should prove valuable for crossing with other varieties to produce smut-immune oats for different sections of the country.

Plant improvement increases our food supply. The double rows of cabbage showing good stands are planted with Wisconsin yellows-resistant selection; the other rows with ordinary commercial varieties.

At the West Virginia Experiment Station strains of corn resistant to smut have been isolated by inbreeding. These types should prove of great value in breeding high-yielding, smut-resistant kinds of corn. The reduction of smut in corn will mean much in increasing our food supply. It is estimated that during the four years, 1917 to 1920, the average annual loss from corn smut was 80,000,000 bushels. If this loss could be prevented and the corn thus saved used for pork production, 800,000,000 pounds of pork could be produced, or the equivalent of 4,000,000 hogs weighing 200 pounds each. These 800,000,000 pounds of pork contain 1,280,000,000,000 calories, which are sufficient to feed 1,280,000 people for a period of one year, assuming that people can live on pork alone.

Another plant breeding accomplishment of great importance is the Robust bean, developed through selection by the late Professor Spragg at the Michigan Experiment Station. It is partially resistant to blight and anthracnose and apparently is immune to mosaic. At the Michigan Experiment Station it yielded 11 bushels more per acre than its nearest competitor in the test. If we assume that Michigan's bean acreage is planted to the Robust type and a difference of 10 bushels per acre is maintained, the increase in production for Michigan alone due to the use of this improved variety would be 4,436,000 bushels. One pound of navy beans contains 1,500 calories, and on this basis the above increase would be sufficient to feed 399,240 people for one year.

However, just as people cannot live on pork alone, they cannot live on beans alone. But if we learn a lesson from our New England cousins, they can fare well on pork and beans. Thus, if we can increase our corn yield by reducing the smut and increase our bean yield by using Robust beans, we should be able to feed many additional people.

At the Wisconsin Experiment Station Dr. Jones and Dr. Walker and their co-workers have developed by selection strains of cabbage resistant to the disease known as yellows. It is now possible to grow cabbage on land on which the cabbage crop was once a failure. Not only have the results held good for Wisconsin, but tests in Virginia show that the yellows-resistant types outyield ordinary commercial types. Dr. Fromme of the Virginia Experiment Station found in his tests that only 15 per cent of the plants of commercial varieties escaped yellows infection as compared with 94 per cent for one Wisconsin strain and 89 per cent for another. Two commercial varieties averaged 2.5 tons of cabbage to the acre, while the average yield of the two Wisconsin strains was 14 tons to the acre.

Plant Improvement

A classical example of plant improvement is that of Marquis wheat. It is a hard spring wheat which Saunders in Canada developed by crossing an early ripening Indian wheat, Hard Red Calcutta, with Red Fife. A strain with high bread making strength and good color of flour was selected from the descendants of this cross. Among its advantages it numbers early ripening tendency, a quality which allows it to escape rust; stiffness of straw; heavy weight per bushel; good appearance of grain; and high milling and baking quality. In 1914 it made up about three per cent of the wheat acreage of Minnesota and the Dakotas. Since that time this variety has increased rapidly in popularity, and in 1919, only seven years after being introduced, it made up about 60 per cent of the total spring-wheat acreage.

As another instance of wheat improvement, may be mentioned the Kanred variety developed at the Kansas Experiment Station. It is a selection of one of the hard red winter

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Big Brothers

By F. N. Darling

County Agent, Cabell County, West Virginia.

DEAN ALFRED VIVIAN of Ohio State University once made the statement that at least 85 per cent of the leading business and professional men were country reared.

We decided to put this statement to the test during one of the regular luncheon days of the Huntington West Virginia Kiwanis Club. There were more than 100 Kiwanians present, and 90 per cent of them raised their hands, signifying that they had been country reared.

It was right at this point that the club's agricultural committee saw its opportunity to start a real building program, for "We Build" is the Kiwanis slogan. A conference was held with the county agent and the following plan of work outlined:

1. Secure 50 Big Brothers for the 4-H Club boys and girls. The main object of this work is to encourage these boys and girls in various ways. Financial aid is not required.

2. Cooperate with at least five communities in holding meetings. Furnish a part of the program.

3. Invite the whole club to visit the 4-H Camp and lunch with the boys and girls.

4. Provide a program for two regular noonday luncheons.

5. Supply speakers for community meetings from time to time.

6. Conduct a roadside beautification contest.

This all happened nearly two years ago, and it is interesting to note the many pleasing results. Not only was every goal mentioned in the program reached, but much additional work done. Nearly every Kiwanian became so enthused over the agricultural program that it soon became the club's leading activity. Fifteen neighboring rural communities were reached in one way or another, bringing about a very friendly relation between the farmer and the city man, so much so, in fact that rural folks are now inviting the Kiwanis Club to furnish many of their programs.

The Big Brother project proved to be the most popular. In carrying this out each Kiwanian, and there were 62 or 12 more than the original goal, played the part of a buddy to some

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Why Burn Corn-stalks

By George H. Harrison

WHAT should become of the corn-stalks?

Every year hundreds of thousands of acres of them in the corn belt go up in smoke, for the farmers who burn them do not care to wrestle with them in the preparation of their fields for the new crops. Neither would they have them on the shovel points in corn cultivation time, nor yet on the surface to clog the hay of a new meadow that followed where the small grain was taken off. There appear to be a few excuses for burning stalks instead of conserving them, but there is one big reason why they should remain in the soil. They help to prevent erosion.

There is some fertility to be gained from the decomposition of the fodder in the soil, but this is as nothing compared with the benefits from the stalks in the partial arrest of the sheet erosion that takes the best of the soil down toward the gulf. I have seen many farmers keeping the stalks on the ground at all hazards. When questioned, they gave as a reason that where the stalks remain, the washing is much lighter. This has to do with the rolling areas of the corn belt especially.

An example of this class is F. L. Lartz, apparently one of the best farmers in Cass county, Iowa, since his fields remain rich, his buildings in a high state of improvement, and his slate clean of debt. His farm is quite sharply rolling.

"I couldn't think of burning the stalks," Lartz explained. "If it were not for the stalks I keep plowing under, or disking to pieces in preparation of the small grain seeding, my fields would not be so rich, and then there would be a lot of little ditches coming down the hillsides. If the ground were cleared off by burning them, it would give the water a full sweep. You see the stalks act like so many little dams. If the water does run over them, part of the soil, at least, is held behind them."

Also, Lartz finds that with the stalk left in the ground he gets more advantage of the rainfall. More soaks in because of the slower run-off.

Lartz is one of a great many who hold to that idea of soil erosion arrest by saving the stalks, and they reside and farm in the rolling areas. But when you go down on the level lands, there are farmers still conserving the stalks though they do not have much of the erosion problem. They will state, pointblank, that burning corn-stalks is a rank waste of fertility.

Turned Under Soon

Joseph Ostertag living near Honey Creek, Pottawattamie county, is so well sold on the idea of corn-stalk fertility that he does not even allow his farm animals to clean them up in the fall. While men are picking the corn, Ostertag is following as closely as he can with his gang plows and turning the field under. The sooner the stalks can be plowed down, the more they decompose before the next cropping time, he avers. And he believes that the foliage of the stalks is more valuable fed into the soil than it is into the livestock. Ostertag is a mighty good and successful farmer. His is a farm of weedless fence rows.

Gilbert Akerlund, near Fremont, Neb., in the Platte river valley, makes use of the stalks because they make

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A fine field of certified Tennessee winter barley.

Controlling Loose Smut

By J. S. Wills

County Agent, Botetourt County, Virginia

WHEN the Virginia Crop Improvement Association undertook some years ago the certification of seed crops, the control of loose smut (Ustilago Tritici) in wheat and barley was something of a problem. Certified seed must show less than one per cent of transmissible disease. In some instances fields of grain would show as high as 15 per cent loose smut infection by actual count, but meet every other requirement for certification.

In order to control loose smut and its near relative, covered smut, the hot water method of treatment was resorted to with a very large measure of success. The work has been done on a larger scale probably in Botetourt county than anywhere else in Virginia. Large quantities of certified barley, as well as wheat, are grown in this county and the hot water treatment of the seed to be planted has been practiced each year since 1922.

The treatment of grain by the hot water method may seem a bugbear to the uninitiated, but it is not half so bad as it sounds. On September 28, 1925, Jas. G. Godkin, Extension Plant Pathologist, V. P. I., and the writer, with the help of the farmers for whom the work was being done, treated 157 bushels in eight hours, and we have frequently treated 100 bushels in a single day. This, however, was group effort, but is as relatively simple when undertaken by the individual.

Considerable care has to be exercised in drying the grain after treating; a clean floor, such as may be found in the granary or barn on the average farm, is needed. Spread out in

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ALABAMA

Experiment Station

By P. O. Davis

Alabama Experiment Station

M. J. Funchess, Director of the Experiment Station, and Dean of Agriculture, Alabama Polytechnic Institute, with his station staff.

ON the beginning of the Alabama Experiment Station Col. J. S. Newman, director, made the following statement in Bulletin No. 1, the first official report published July, 1888:

"An exhausted farm of 226 acres was purchased to be used for the purpose. Much of it was turned out on the commons; the buildings and fences on the remainder were in a very dilapidated condition. A large portion of the land had been abandoned for cultivation on account of its poverty and gullied condition.

"Under these circumstances, with only one official connected with the station, the director who was also pro-

fessor of agriculture, progress in development was slow, especially since the funds appropriated to the station were small in amount. Notwithstanding these difficulties, considerable progress has been made in some departments of the work—especially is this true of the horticultural department."

This report was a resume of the first five years—1883 to 1888. Field experiments had been conducted each year, and manuscripts for bulletins furnished to the department of agriculture for publication as required by law.

Work was divided into two general classes: first, the demonstration of facts already known to the advanced agriculturists, but not generally disseminated; and second, original investigation having for its object the discovery of truth.

On the equipment he added: "The equipment, so far as machinery and improved implements are concerned, has been, until now, inferior to that of an ordinary well conducted, private farm.

"Much time and labor has been expended in clearing up pine thickets, filling gullies, building fences, and arranging for a supply of water under pressure."

Therefore, the Alabama station had a humble beginning.

Col. Newman was a farmer and a writer. He was a Georgian. He was the first director of the station and served from 1888 to 1891.

Research Started

Although the station was actually started by state act in 1883, it was not until 1888 that a well planned program of research work was started. The Hatch Act which had been fathered by Col. William H. Hatch, a Missouri Congressman, became a law that year and this appropriation of Federal funds marked the real beginning of the Alabama Experiment Station. It is said that Col. Hatch battled for a half dozen years before this act which perpetuates his memory was enacted into law.

From 1891 until 1902, Dr. William Leroy Broun, president of the Alabama Polytechnic Institute, was president of the board of direction of the experiment station. At his death in 1902 Dr. O. D. Smith, acting president, was acting director of the experiment station board for eight months. Dr. Charles C. Thach, new president of the college, then filled

Comer Hall, agricultural building, Alabama Polytechnic Institute.

this position for a few months, or until July 1, 1903, at which time John Frederick Duggar was made director. Professor Duggar served in this capacity and also as agriculturist for the station and for the college, until July, 1921, at which time Dan T. Gray was made director of the station and dean of the college of agriculture. He served in this position until January 1, 1924, at which time he was succeeded by M. J. Funchess, present dean and director.

Fertilizers for Cotton

Thus the station has had few directors. It has had no branch stations. As this is being written the legislature is being asked to appropriate funds for establishing and operating four branch stations on the four big soil divisions.

Early bulletins published by the Alabama station record the fact that from the beginning this station has been making inquiry into a large number of subjects. Fertilizer tests on different field crops, fruits, and vegetables, variety tests, insect and disease control, animal feeding and breeding, and other subjects have received attention from the beginning.

But the station is best known for its work on fertilizers for cotton. Here it has rendered its greatest service to the state. In recent years the annual fertilizer bill varied from $15,000,000 to $20,000,000, and 80 per cent of it went under cotton. Consequently, a study of fertilizers for cotton on the different soil types has been a major research project.

In the early days when the fertilizer business was struggling to become an industry there was a lack of uniformity and it was difficult to plan comprehensive fertilizer experiments. Later it became possible to plan uniform experiments based upon the different ingredients and by following a standard plan over a long period of years the station has learned what fertilizer makes the best returns on the different soil types. In addition, considerable progress has been made in determining the amount to apply per acre.

Therefore, much waste in the use of fertilizer has been eliminated. Especially is this true of those farmers who have followed the results of the experiment station. No longer is fertilizer surrounded by mystery. Certainty prevails.

The work has proven beneficial not only to farmers but to the fertilizer industry. It has helped farmers by telling them what to use and how to use it, and it has helped the fertilizer industry by increasing consumption.

In working out what has become known as the "Auburn Method" for fertilizing cotton the Alabama station has taken a unique position. It has become nationally known. This work is invaluable.

Winter Legumes

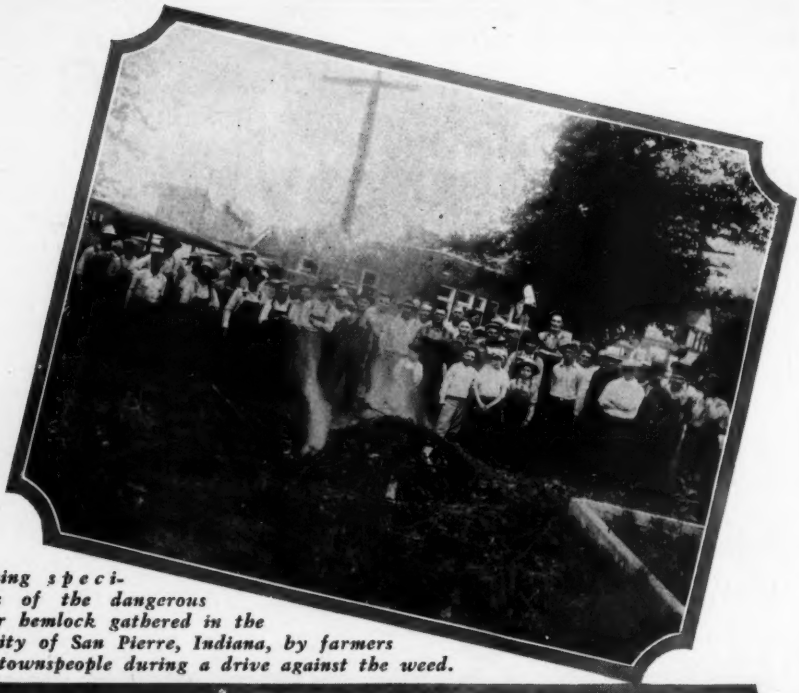
Perhaps the work on winter legumes ranks second in importance. Until the Alabama station took hold of the winter legume situation and set to work to untangle it and give the farmers practical information, winter legumes were hardly known except in name. Farmers here and there had tried them in a small way, but no one seemed to know how to succeed with them. It was a hit or miss proposition. Agricultural leaders were in the position of advising farmers to plant winter legumes without being able to tell them which one to plant and how to plant it.

By a system of experiments the Alabama station learned the advantages and disadvantages of the different winter legumes. Those not measuring up were discarded. Meantime, fundamental facts were revealed as to how to grow them.

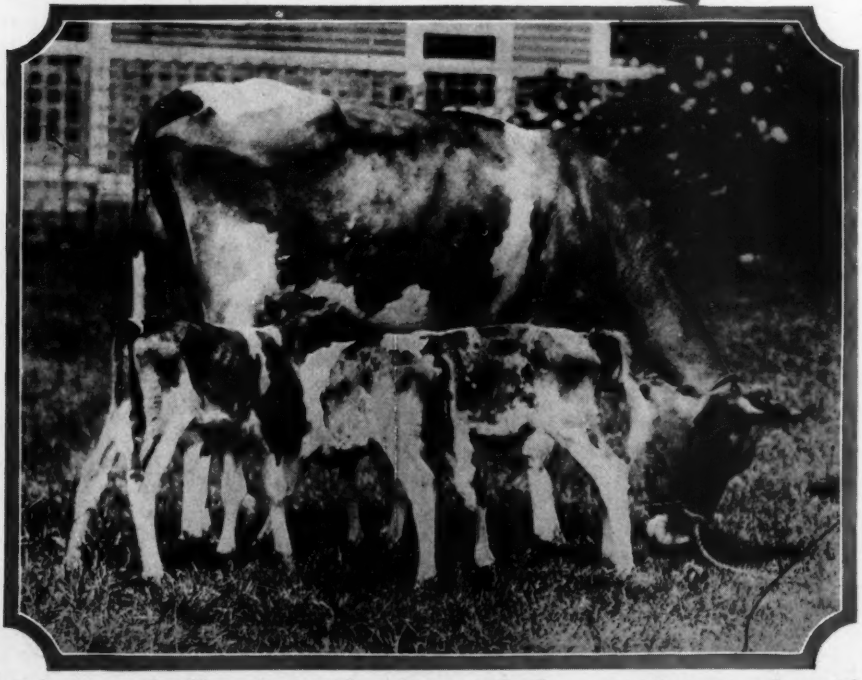
The result was that winter legumes narrowed down almost entirely to hairy vetch. In the lime land section a few farmers still hang to bur

(*Turn to Page* 58)

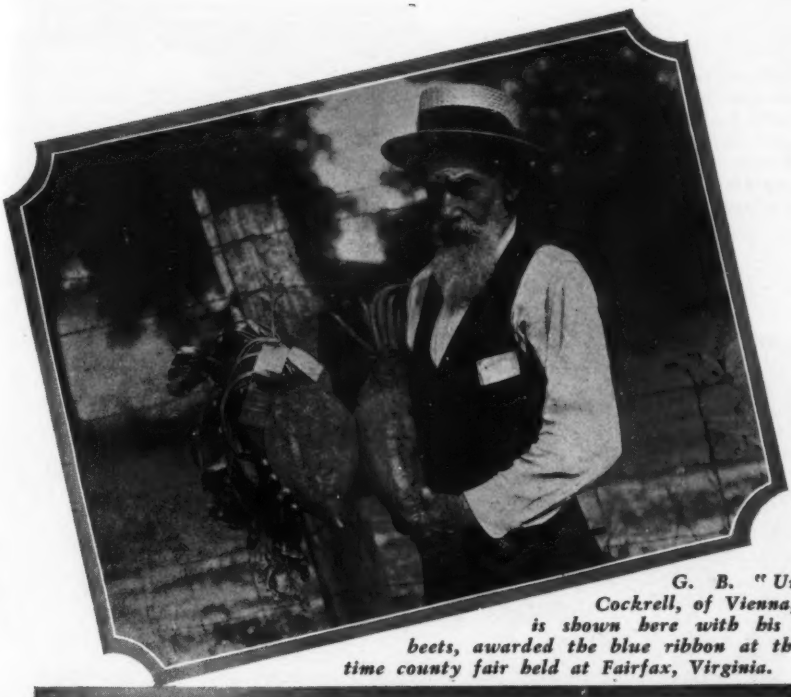
Pictorial



Burning specimens of the dangerous water hemlock gathered in the vicinity of San Pierre, Indiana, by farmers and townspeople during a drive against the weed.



Only two weeks old are Tom, Dick, and Harry, the three young Guernsey calves with their mother "Claire of Fox Run". They were bred by Leon Whitcomb, superintendent of Maple Rock Farm, Pepperell, Mass., and are owned by J. B. Henderson.



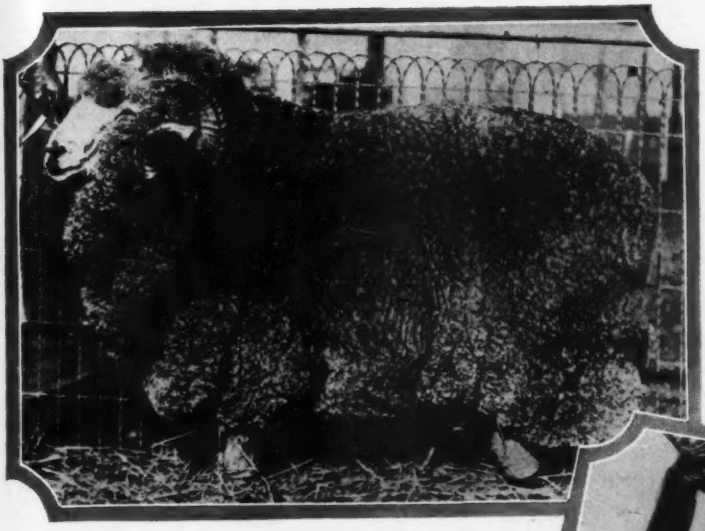
G. B. "Uncle" Cockrell, of Vienna, Va., is shown here with his prize beets, awarded the blue ribbon at the old time county fair held at Fairfax, Virginia.

Claire Windsor, motion picture star, is shown with the primitive plow that broke the ground for the old San Fernando mission. This mission was founded in 1812 and is one of California's most famous land marks.

Miss Helen Bernaby, last year's winner of the annual mowing contest at Durham, N. H., congratulating this year's winner, Walter Stickney, who mowed a quarter of an acre in 6 minutes 3⅛ seconds.

Miss Ellen Crossman of the Government bee farm at Somerset, Maryland, holding a honeycomb full of bees from the farm. Scientific studies are made of the habits of the bees. They are weighed before and after they have collected honey from flowers and the honey is studied for its chemical qualities.

An official of the Department of Agriculture Experiment Station at Beltsville, Md., where experiments are being conducted in an effort to help each hen attain her aim of "an egg per day".



This photograph, taken in Sydney, Australia, shows the Grand Champion Merino ram owned by the E. F. Body estate and valued at $25,000.

Right: This specie of bat has been appropriately dubbed the "flying fox" by Australian farmers. The queer animal has long powerful wings capable of sustaining it on long flights. The bats breed in inaccessible rookeries and come forth in thousands to raid orchards.

Some of the last of the longhorns are shown here in a lot in San Antonio, Texas. They are to be used for breeding purposes in restoring this famous and picturesque cattle.

These seven pigs, owned by Tom High of Walters, Oklahoma, reached the weight of 330.7 pounds each at the end of 180 days of feeding in a Ton Litter contest. This is believed to be the highest average weight reached by a litter in the United States.

The litter was cross bred, a purebred Duroc boar having been used on a purebred Hampshire sow. Of the 11 pigs at farrowing time, two were born dead and two others were chilled. Ground barley with forage over a range of 160 acres of land were the principal feeds this litter received. A profit of $22.71 over feed costs was secured. The pigs gained an average of 1.81 pounds a day at a cost of $6.33 per hundred pounds.

Dr. Henry G. Knight, new Chief of the Bureau of Chemistry and Soils of the U. S. Department of Agriculture, being sworn into office by Mr. R. M. Reese, Chief Clerk of the Department, on October 1. Secretary W. M. Jardine stands at Dr. Knight's left.

The Editors Talk

All days are good days. If we resist what the day brings, we make a "hard day." If we go about our work sullenly, doggedly, our work becomes the "daily grind." If we meet the day in a full sense of its blessings, we have a "full day"—a day of opportunities, in which we should rejoice. (Ex.)

All Days Good

In no home is the real and intended spirit of Thanksgiving so genuinely instilled as in the American farm home. To those who have ever had the privilege of sitting around its festive board comes an unforgettable picture of peace, plenty, and reverence to a guidance that has seen toilers through another year of hard work.

Another Thanksgiving is at hand. We can rejoice with our farmers in the completion of another harvest. We are thankful to know that the year as a whole has been favorable to them. According to a report issued October 1 by the Bureau of Agricultural Economics at Washington, the farm situation is better than it was a year ago. The Bureau places the general index of purchasing power of farm products at 88 compared with 83 at the same time last year, the 1909-1914 five-year period being used as a base of 100.

In summing up the season's apparent production and returns in the different sections of the United States, the Bureau says: "It can probably be called an average year for the South; for the Wheat Belt a good year in the North and a fair year in the South; for the Corn Belt a fair year in the West, but a poor year in the East; for the Far West a good year in the range States and Pacific Northwest."

We know that there are farmers as well as others who are discouraged and disappointed with the results of their year's efforts. Let us remind them of the spirit with which the pilgrim forefathers in the face of inconceivable hardships and privations set aside the first day for Thanksgiving 307 years ago.

"The great rural interests are human interests, and good crops are of little value to the farmer unless they open the door to a good life on the farm."—THEODORE ROOSEVELT.

Rural Yard Sticks

Rural life is getting itself measured. What the good country people neglect to measure for themselves, well-intentioned friends willingly measure for them. Thus, there arises the question of the yardstick and there are a great variety available. Which one shall be used to measure the good and the bad in our country life?

This subject has been ably discussed by Liberty Hyde Bailey in an address before the Tenth Annual Meeting of the American Country Life Association held recently at the Michigan Agricultural College.

Dr. Bailey made one fundamental idea the theme of his address. He said, "I have been impressed for many years that if we made mistakes in our country life work the major ones are not in our reports. They are not in our findings.

They are not in our intentions. They are in the emphasis that we place on certain facts, certain points of view, certain positions."

Measuring all things by one thing; a habit that has held up progress in many fields of work!

A yardstick of immediate interest is the economic viewpoint. The speaker said that people in general overstress the relative importance of the economic situation. That is, we are measuring farming by economics. But, as Dr. Bailey pointed out, "I am casting no aspersion on the great science of economics, which must make a vaster contribution to us than in the direct realms of commerce and trade. It is said," he continued, "that commercial economics is founded in principle on the law of supply and demand."

Dr. Bailey apparently has grave doubts about the actual working of the law. He suspects that the law in commercial practice is not allowed to operate freely. "The lock-out, tariffs, discriminatory laws, and all kinds of conditions and regulations subvert the operation of the law of supply and demand. It is a question whether a regulated law of supply and demand is a law of supply and demand at all."

If this is so, how can commercial economics be soundly based on a principle that is only partially operative? Further and of much more importance, how can such "commercial valuations" be applied to "rural situations"? The speaker concluded on this point that it is a question if the commercial yardstick can be successfully used as a measure of the rural phase of our civilization.

Truly, the great science of Adam Smith has a responsible future before it—possibly a stormy future. All the more credit to our present agricultural economists who are blazing a trail through a tangle of misunderstanding to measure rural economic values by rural yardsticks. Probably, as time goes on, the world will learn something more of the workings of the law of supply and demand.

There are others who would measure the rural situation by the social group "and I think they are as far wrong as the other."

Another measure is dissatisfaction. Beware of "professional dissatisfiers." Dissatisfaction apparently is so quick to respond in the human breast that it can be organized and capitalized. Excellent advice! On the other hand, the speaker pointed out that all farmers cannot, under present conditions, be made prosperous and contented. For one thing, too many farmers unfortunately are on land that should not be in cultivation—marginal lands not fit for farming at least under present conditions. A vast question of national land utilization presses for solution.

The idea of limiting production is emphatically disapproved by Dr. Bailey. The idea is "not democratic" in his opinion and many people must agree with him. Over-production is undoubtedly an evil for the farmer, but it is equally doubtful, if the remedy is to be found in an arbitrary limitation of production.

Lastly, Dr. Bailey in conclusion points out "that we are too ready to measure all the elements of the rural situation in terms of our present-day standard. Farming is as old as the hills. We are trying to solve it by twentieth century criterion. No wonder we fail."

Country life is a mode of living. It can only be measured when it is lived for its own sake. It expresses the most fundamental of man's characteristics. Superficial measurements lead only to confusion. Since the dawn of history, farmers have managed to look after themselves and much of the world besides. Given what they demand, a fair and equitable opportunity with other great groups, and there is little doubt they will supply simple and unmistakable yardsticks for expressing the real values of our national country life.

Hence lastly springs care of posterities;
For things their kind would everlasting make:
Hence is it that old men do plant young trees,
The fruit whereof another age shall take.
—Sir J. Davies.

Tree Census

An added interest has of late been taken in counting people and things. For the first time the Turks have recently carefully counted themselves, considering it so important that they stayed indoors all day to be counted. Most of us are content to be counted wandering about wherever we may be.

In the realm of counting things, there is a proposal before one of the House Committees for counting the trees of the United States. A tree census should be regarded as essential. It should be supported. Time and space both are required to grow a tree. As population increases, the need for trees will increase; though, unfortunately, it is the tendency as population increases to be more thoughtless and try and get along with less.

A debt, however, is owed to the future. In looking into the future, it is time that a tree census is made; that stock is taken of our diminishing national resources. It is essential that there be intelligent planning of the most productive policies of the future to bring home more forcibly to the consciousness of the people, the great esthetic and practical value we have in trees.

Spirits that live throughout,
Vital in every part, not, as frail man,
In intrails, head, or heart, liver, or reins,
Cannot but by annihilating die.
—Milton.

The Goal

Gallant efforts have been made to cross the ocean by aeroplane. Many such efforts have been made to reach America; to sail westward from the older countries and land on the coast of America—or as the early voyagers called it, "that great tract of land stretching from the Cape of Florida unto those islands which we now call Newfoundland."

This great tract of land was the goal of mariners in the sixteenth century; it is still the goal of aviators in the twentieth. Something has been said about making laws to prevent aviators doing such things. While possibly the value of such exploits may be increased by some measures of coordination and control, no laws will stop a man expressing the faith that is his. Lives have been lost but the great faith, courage, and endurance of our forefathers are not lost. The Atlantic has recently been searched for those who have given their lives in these great enterprises. In the sixteenth century, as now, the Atlantic Ocean was searched for those who were lost in voyages of discovery of our coast. Witness the account of the last memorable voyage of Humphrey Gilbert, afterwards written by Hayes, Gilbert's Rear Admiral. The two were sailing in separate vessels—Gilbert in the Frigate—Hayes in the Hind:

"Monday, the ninth of September—in the afternoon the Frigate was near cast away, oppressed by waves, yet at that time recovered; and giving forth signs of joy, the General setting abaft with a book in his hand, cried out to us in the Hind so oft as we did approach within hearing: 'We are as near

to Heaven by sea as by land.' "

"The same Monday night about twelve o'clock—suddenly her lights went out—our watch cried the General was cast away, which was quite true. For in that moment the Frigate was devoured and swallowed up in the sea."

"Yet still we looked out all that night and ever after—omitting no small sail at sea."

That great tract of land from Florida to Newfoundland was discovered by the undying expression of man's faith and courage. It has been developed by the same supreme qualities and no laws that man can make will ever prevent him so expressing himself.

Would I a house for happiness erect,
Nature alone should be the architect;
She'd build it more convenient than great,
And doubtless in the country choose her seat.

—COWLEY.

Rural Roofs

The Almighty made the country beautiful. Man seems to try and make it ugly. In fact, had Nature not had a few hundred thousand years start on man, it is difficult to imagine what some parts of the country districts would look like today. Possibly that is why Nature took so many hundreds of thousands of years to prepare the earth for man. She wanted an even chance.

Bill-boards and false front single story buildings are two abominations.

Progress is being made in getting rid of bill-boards, and those that must remain are being made more artistic. Every credit should be given to the agencies doing this good work. The ugly false front above many one-story buildings does not seem to have attracted so much attention. Just what impression a false front second story is supposed to create is difficult to say, since it is only by standing exactly in front of such a building that the illusion of two stories is even faintly created.

The roof of a house is the chief thing about it. It shelters the inhabitants; it is the sign of hospitality. The roof should be visible or at least there should be no effort to hide it.

Ruskin commented to the effect that we ask our friend to share our hospitality under our roof. We do not ask him to come and stand under our wall.

There is nothing to be ashamed of, even of a roof of a one-story building. The humblest home should have an honest and visible roof.

While there may be in many cases practical difficulties in building one-story buildings, there is by the same token a great field for some one to plan the smaller types of buildings of a type that fit into the rural background; buildings simple and honest in design, that are planned for those conditions; that because of their simplicity and honesty invite, and not by their sham and pretense repel.

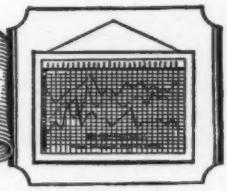
Many fine examples exist, particularly the older types of homes and small buildings. A campaign is needed to make such suitable types better known. Both bill-boards and false front buildings should go.

FERTILITY

"There is a definite relation between the fertility of the soil and the fertility of the human mind. People that live on exhausted, infertile soil are not mentally up to the standard of people living on soil whose fertility is maintained."

—HUBERT WORK,
Secretary of the Interior.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

Sheltered Machines Last Twice as Long

Whether or not it pays to house farm machinery may be judged by the reader after he has gone over the following conclusions of Professor J. C. Wooley of the University of Missouri:

A walking plow, according to the best averages obtainable, lasts 15 years if not housed, 20 if housed, and in either case costs $2.25 for repairs.

A gang plow lasts 10 years exposed, 20 housed, and costs $9.00 for repairs.

A corn planter lasts 4 years exposed, 8 housed, and costs $13.34 for repairs.

A corn cultivator lasts 8 years exposed, 20 housed, and costs $7.50 for repairs.

A mower lasts 7 years exposed, 12 housed, and costs $14.15 for repairs.

A binder lasts 5 years exposed, 12 housed, and costs $23.34 for repairs.

A farm wagon lasts 10 years exposed, 24 housed, and costs $20.00 for repairs.

A disk harrow lasts 8 years exposed, 15 housed, and costs $9.38 for repairs.

Corn Borer Becoming Dictator

The corn borer, in spite of $10,000,000 of Federal money spent recently to "show him," is becoming a dictator of crop methods in the region he has invaded. Even in those states where his hordes are expected soon, plans are on foot to change practices to meet the invasion. The following statement from Iowa State College shows how that state is concerned: "The arrival of the borer will mean changes in the crop rotation. It will mean that no longer can farmers disc their oats into stalk fields. Either the stalks must be burned or plowed under very thoroughly. The use of soybeans and other crops in the place of oats is a possibility. Varieties of corn which can be planted late and still mature will probably be used. Plows will have to be used which will turn under corn-stalks and trash very efficiently. A properly adjusted rolling cutter and jointer will be needed, and these supplemented by wires. Borers can not live in silage juices and hence the silo may receive more attention in many quarters. Also the shredding of corn-stalks will destroy the borers so that this practice may increase. Because it is necessary to burn the stalks where borers are present, Iowa farmers should begin building up the organic matter in their soils by applying manure or turning under green manure crops such as sweet clover. It appears now that the borer does more damage in certain types of soil than others and more study needs to be given to determine in what soils they do the most or least damage."

Let Lightning Lighten Labor

Electrification of all farms of the country could be accomplished within five or six years if each farm set aside, for that period of time, an amount equal to the annual cost of operating the cheapest automobile, it is calcu-

lated by Prof. E. W. Lehmann, head of the farm mechanics department, College of Agriculture, University of Illinois. Farms of the country could be electrified within 10 years, he says, if each farm set aside, for that number of years, an amount equal to the annual cost of keeping one horse. "Human energy must be valued at a frightfully low figure," says Prof. Lehmann, "to compete with the electric motor in the performance of farm chores and work. From tests made by the Illinois college on rural electrification, when electrical energy was valued at 10 cents a kilowatt hour, it was found that 5 cents worth would wash 33 pounds of clothes, separate 1,000 pounds of milk or draw 250 gallons of water. In a recent report of the national committee on relation of electricity to agriculture, more than 200 uses of electricity on the farm were listed. If only a small percentage of these were practical for the average farmer, the field of uses for developing a load would be very great.

Reenforcing Wheat

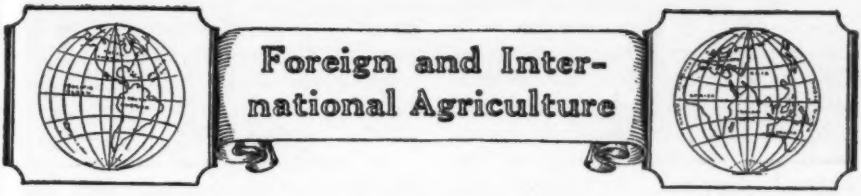
Investigations by the crop chemistry laboratory of the Bureau of Chemistry and Soils, United States Department of Agriculture, have shown that by applying mineral nitrogenous fertilizers at the time wheat is heading, the protein content of the grain may be increased by about 30 per cent regardless of whether the soil needs nitrogen or not. Sometimes the protein in the wheat is increased as much as 50 per cent. This treatment also prevents "yellow berry" which frequently afflicts winter wheat and detracts from its value. Although it usually happens that in wheat having a high percentage of protein the berries are shrunken, in the wheat obtained by applying nitrates at heading time the berries are just as plump and yield as much flour as normal wheat, and, because of the higher protein content, have a higher food value. The increase in the protein of wheat not only adds to the food value of bread, but also improves the baking qualities of the flour. The loaves made from the high protein wheat obtained by applying sodium nitrate at the time the wheat is heading are larger and of better quality than bread made by exactly the same methods but from the flour of wheat not treated with sodium nitrate at the heading stage.

Forest Soils Hold Water

Soils in forested areas absorb more water and hold it longer than soils in the open, according to the Department of Agriculture in calling attention to the importance of different factors in flood control. The Department emphasizes the importance of results in this direction obtained by Prof. Bode of Iowa State College who found that the average content of water of soils in timber-covered areas, as well as the maximum and minimum contents, was above that for soils in unprotected areas. Seepage of soil water was found to be most rapid on open slopes following a rain, while it was greater in quantity, steadier, and distributed throughout a longer period in the timber areas. This backs up the theory that forests regulate stream flow, reducing the danger of floods, and preventing the drying up of streams.

Corn-Stalk Has Big Housing Capacity

That a corn-stalk may become a veritable apartment house for borers was shown recently near Toledo, Ohio, when 35 borers were found per stalk in one field. There are at least 10,000 stalks on an average acre which means, at this rate of infestation, 350,000 of the insects. It is to prevent this sort of overcrowding in corn-stalks that the big clean-up campaign has been carried on.



The Oldest Station

By G. E. Langdon

Wisconsin College of Agriculture

A NUMBER of the fields at Rothamsted have been under known cropping for 88 years, and under the same treatment for 83 years. The facts obtained from the observation of these old plots are not exactly new in any sense, though they do grow more interesting through new developments as they age.

The so-called grass plots, which have been in hay for 70 years, show some interesting things. They have proven conclusively that grass especially requires lime, and in addition is particularly dependent on a good supply of the minerals, potash and phosphorus. This is quite as true of legumes.

They have found also, on careful analysis of samples from each plot taken every year, that the grass which yields the heaviest more often has less feeding value than some of the yields considerably less in weight but higher per gram in nutritive value.

In England they frequently refer to the color of grass as being "a healthy green" or contrastingly "an unhealthy green." A bluish gray green, which they term an unhealthy color for grass, is evident on those plots where an excess of ammonium sulphate has been applied. While there is a heavier growth on these plots, the feeding value, they find on analysis, is quite low. The contrasting green colors, depending on the fertilizer applied, are quite apparent. Another clearly demarcative line divides the limed from the unlimed part of the field. Still another plot, unmanured and untreated for 60 years, is nothing but weeds of every description and kind. All plots are treated alike in that all of them are mowed at the same time every year.

The wheat plots are the oldest of all, dating back to 1837. The top yield of 35 bushels was attained by using a mineral mixture of sodium, magnesium, and potassium sulphates, plus superphosphate and what they term a triple dose of ammonium sulphate (618 pounds to the acre). This plot though had been fertilized beyond the point where the crop received paid a profit over the cost of fertility; it was beyond the point of "diminishing returns."

Man and Nature

One plot, unmanured and untreated in any way, since 1839 is still producing at the rate of 12 bushels. In 1882, just as an experiment they cut off a strip at the end of this wheat field, which had been constantly in wheat for 43 years. They allowed it to lie fallow and have never touched it since that time. It is now one of the most dense of miniature forests and impenetrable underbrush, showing what would happen to England if for so short a time as 50 years man's influence over nature should stop.

Another unusual bit of experimentation carried on in connection with these wheat plots is in the form of baking and milling tests, for the purpose of finding out whether different fertilizers have different effects on the quality of the end product of the wheat, as say bread. So far, they find there are none.

Some of the more recently undertaken work at Rothamsted is in a statistical way of evaluating the effects of the weather on the wheat crop, as the effects of sun and rain separately, at different stages of the plant's growth.

At Rothamsted, mixed fertilizers including potash have been used with success on potatoes and beets, especially, and with other root crops."

Plant Hunters Return

P. H. Dorsett, an agricultural explorer for the United States Department of Agriculture, recently came back from Asia with thousands of selections of seed, plants, scions, bulbs, tubers and cuttings which it is hoped may contain many that will be of use in this country. Mr. Dorsett was assisted in his explorations by his son, J. H. Dorsett. Because of the importance of wheat and barley in this country and the increasing importance of soybeans and mungbeans, many selections of these crops were made. The explorers got together one of the best collections of soybean varieties ever brought in. They were obtained in Manchuria with the assistance of B. W. Skvortzow, a Russian botanist teaching agriculture in Harbin, Manchuria.

Manchuria grows about 70 per cent of the soybeans produced in China, and has more than 9,000,000 acres devoted to the crop, about 2¼ times as much as grown in the United States. The mungbean is also an important crop in Manchuria and other parts of China, and is increasing in importance here.

Among the many interesting methods noted by the Dorsetts was the winter storage of persimmons in North China. There the fruit is stored out of doors in a cold climate, and is unprotected except for a light covering of straw mats which later in the season is supplemented by loose hay, straw or corn stalks. The fruits, averaging about 4 inches in diameter, are corded up in beds 12 feet x 18 or 20 feet in length and to a depth of six fruits. This method is possible because of the comparatively dry winter with even, cold temperature. The persimmon is peculiar in that it is not only benefited by frost but not injured by freezing. This practice is said to be unique in the world.

P. H. Dorsett and his son, J. H. Dorsett.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

What can be done to produce good truck crops when the national manure heap is getting smaller each year? This is becoming quite a problem all over the country. Experimental work has been done at various experiment stations showing that the right commercial fertilizers will profitably replace at least a part of the farmyard manure. Smaller amounts of manure, together with commercial fertilizers, will produce profitable results.

Additional evidence on this point is always welcome. A new bulletin on this subject is "Chemical Fertilizers for Greenhouse Lettuce," by J. H. Gourley, Ohio Agr. Exp. Sta., Bul. 408, Aug., 1927.

The author shows that in greenhouses "on many soils the amount of manure may be reduced to half if it is supplemented with one-half ton of a 3-12-4 fertilizer (or one of somewhat similar analysis) and maximum commercial crops be grown."

Another important result was that a complete fertilizer produced the best results, that is, a fertilizer containing nitrogen, phosphoric acid, and potash, in preference to a fertilizer containing one or two elements only. If no manure is available, it was found that for lettuce a ton of 3-12-4 or 3-7-9 fertilizer applied annually, together with a green manure crop of soybeans, may produce crops of lettuce that average 80 per cent as large as those grown with the manure, and in some seasons nearly as great.

This work shows that, on lettuce grown in greenhouses, commercial fertilizers have a very definite and profitable place in supplementing manure.

The state of Indiana keeps very detailed figures on the fertilizers sold in the state. A new circular (64 pages) No. 146, "Commercial Fertilizer," has recently been published, giving practical and authentic information on the fertilizers sold. The consumption of fertilizers has increased rapidly during the last seven years. Calculating on the basis of actual plant food in tons since 1920, nitrogen has increased 181 per cent; available phosphoric acid, 127 per cent, and potash, 312 per cent. This is very significant. It seems that the farmers are finding by experience that fertilizers are essential and profitable. It also probably means that farmers over the whole of the eastern part of the corn belt are finding that nitrogen and potash are much more essential than they were years ago.

"Analyses of Commercial Fertilizers," Agr. Exp. Sta., Clemson College, S. C., Bul. 241, Aug., 1927, R. N. Brackett and D. H. Henry.

Soils

"Marion County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 34, Nov., 1926, R. S. Smith, E. A. Norton, E. E. DeTurk, F. C. Bauer, and L. H. Smith.

"Will County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 35, Dec., 1926, R. S. Smith, O. I. Ellis, E. E. DeTurk, F. C. Bauer, and L. H. Smith.

"Lee County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 37, June, 1927, R. S. Smith, O. I. Ellis, E. E. DeTurk, F. C. Bauer, and L. H. Smith.

"Woodford County Soils," Agr. Exp. Sta., Urbana, Ill., Soil Report 36, R. S. Smith, E. E. DeTurk, F. C. Bauer, and L. H. Smith.

"Soil Survey of Iowa Woodbury County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Re-

port No. 40, May, 1926, W. H. Stevenson and P. E. Brown.

"Soil Survey of Iowa Page County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Report No. 41, June, 1926, W. H. Stevenson and P. E. Brown.

"Soil Survey of Iowa Jasper County," Agr. Exp. Sta., Ames, Iowa, Soil Survey Report No. 42, July, 1926, W. H. Stevenson and P. E. Brown.

"Grouping of Soils on the Basis of Mechanical Analysis," U. S. D. A., Washington, D. C., Dept. Cir. 419, July, 1927, R. O. E. Davis and H. H. Bennett.

Crops

Many publications on crops came into circulation during the past month. Some of these are of a technical research nature, others intensive studies of special crops.

Of more general interest will be Arkansas Bulletin 222, "Effect of Different Dates of Planting Corn on Yields." C. K. McClelland, Asst. Professor of Agronomy, the author of the bulletin, while giving no conclusion regarding the best date for planting, analyzes conditions, results of experience, and comparisons of results so that many a grower may make his own decision with regard to date of planting his crop.

We want to also comment in this section upon the report of the U. S. Department of Agriculture on the "Cooperative Extension Work of 1925," which is just being distributed. The report is quite complete on all projects and is well illustrated. It should be of especial interest to all county agents and vocational teachers.

"The Inheritance of Red Plant Color in Cotton," Agr. Exp. Sta., Fayetteville, Ark., Bul. 220, July, 1927, J. O. Ware.

"Crop Yields from Illinois Soil Experiment Fields in 1926," Agr. Exp. Sta., Urbana, Ill., Bul. 296, August, 1927, F. C. Bauer.

Thirty-ninth Annual Report of the Agr. Exp. Sta., U. of Ky., for the year 1926, Part I., Lexington, Ky.

The Quarterly Bulletin, Agr. Exp. Sta., East Lansing, Mich., Vol. X, No. 1, Aug., 1927.

"Report of Three Acre Better Cotton Production Contest 1926," Ext. Dept., Mississippi A & M College, A & M College, Miss., Ext. Cir. 51, Feb., 1927, R. S. Wilson.

Thirty-third Annual Report of the Agr. Exp. Sta., U. of Mont., July 1, 1925 to June 30, 1926, Bozeman, Mont.

Fortieth Annual Report of the Agr. Exp. Sta., of Nebraska, Lincoln, Neb.

"Fruit Varieties in Ohio, II," Agr. Exp. Sta., Wooster, Ohio, Bul. 407, Aug., 1927, J. S. Shoemaker.

"Walnut Drying and Packing in Oregon," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 227, May, 1927, Ernest H. Wiegand.

"Investigations on the Harvesting and Handling of Bosc Pears from the Rogue River Valley," Exp. Sta., Corvallis, Ore., Sta. Bul. 228, July, 1927, Henry Hartman, J. R. Magness, F. C. Reimer, M. H. Haller.

"Varieties of Cotton in Northwest Texas," Agr. Exp. Sta., College Station, Texas, Bul. 364, Aug., 1927, R. E. Karper and D. L. Jones.

Department of Agriculture Immigration of Virginia, Bul. 236, Aug., 1927.

"Apple and Pear Picking Guide," Extension Service, Pullman, Wash., Ext. Cir. 14, M. D. Armstrong.

"Factors Affecting the Variable Growth of Apple Grafts in the Nursery Row," Agr. Exp. Sta., Madison, Wis., Res. Bul. 77, July, 1927, R. H. Roberts.

"The Relation of Scion Variety to Character of Root Growth in Apple Trees," Agr. Exp. Sta., Madison, Wis., Res. Bul. 78, Aug., 1927, Thomas Swarbrick and R. H. Roberts.

"Emergency Methods for Reconstitution of Flooded Sugar-Cane Districts in Louisiana," U. S. D. A., Washington, D. C., Mis. Cir. 107, E. W. Brandes.

"Yield Tests of Disease-Resistant Sugar Canes In Louisiana," U. S. D. A., Washington, D. C., Dept. Cir. 418, June, 1927, R. D. Rands and Sidney F. Sherwood.

"Date Culture in Egypt and the Sudan," U. S. D. A., Washington, D. C., Dept. Bul. 1457, May, 1927, Silas G. Mason.

"Agricultural Project Planning," Federal Board for Vocational Education, Washington, D. C., Bul. 117, Agr. Ser. 31.

American Potato Journal, Washington, D. C., Vol. IV, No. 9, Sept., 1927, R. C. Wright.

Economics

One of the noticeable changes in agricultural production has been the expansion of the cotton belt to the North and West. The development in Texas has been accompanied by new methods of production; a greater use of machinery so that one man can handle a larger acreage of cotton than formerly. The extensive methods of production used in Texas are dis-

(*Turn to Page 53*)

Pages From A Field Note Book

Fertility Maintenance

By G. R. Cobb

Salisbury, Maryland

FOR generations the Insleys of Bivalve, Maryland, have been farmers. The old homestead on which George W. F. Insley now lives has been in the family for many years, and yet the fertility of the land has increased year by year. In the proper use of lime, legumes, and commercial fertilizer, plus some manure, the soil has been improved until now it is a question of maintenance of fertility rather than one of increasing this quality.

During the season of 1927, Mr. Insley spent $1,704.32 for commercial fertilizer while the average expenditure per farmer in Wicomico county is but $200. Mr. Insley, after checking up the yields obtained, together with the added fertility, is convinced that this large amount of fertilizer paid well on the investment.

For instance, in 1927 he cultivated and cut eight acres of asparagus on which he used two tons of bone in the spring, and, just after cutting the grass, applied five tons of a 7-6-5 commercial fertilizer. Next year, however, he will use a 3-8-8 formula as he is convinced that the crop needs more potash.

On 12 acres of sweet potatoes, he used 1,800 pounds per acre of a 3-8-8 commercial fertilizer. This is one of the two analyses most generally used on the Eastern Shore, the other being a 2-8-10 formula.

One of the largest crops grown on the Shore is tomatoes, and Mr. Insley had 16 acres of this crop on which he used 1,000 pounds of fertilizers per acre. Before setting the plants he applied 600 pounds of a 3-8-8 fertilizer and later, when the plants had become established, he side-dressed with 400 pounds of a 4-8-4 formula. Incidentally the 4-8-4 was at one time the only formula used on tomatoes, but recently the growers have discovered by experiments that the 3-8-8 gives larger yields and better quality fruit, thus a drift from the 4-8-4 to the 3-8-8 mixture.

Until recent years it was thought that on the Sassafras series of soils, phosphorus was the limiting factor, but work by the Delaware Experiment Station has shown potash rather than phosphorus to be the limiting factor on this type of soil. For this reason and because of results secured under farm conditions the growers are demanding and getting higher potash fertilizers.

Small fruits, especially raspberries and blackberries, have been the "hobbies of Mr. Insley for years and no one on the Peninsula has done more experimenting with these crops. As a result of his experiments, he has learned their likes and dislikes to such a degree that he now gets yields larger than any one else and a quality that tops the market. On these two fruits he uses commercial fertilizer at the rate of 800 pounds per acre analyzing 7-6-5. In addition to this he uses wood ashes and kainit "whenever the plants need them."

For cover crops Mr. Insley uses cowpeas. He also has several acres of alfalfa which he turns under for humus. Lime is used at the rate of

1,000 pounds per acre, but not regularly as he has learned that lime lasts longer than was supposed and also that unless green matter is turned under, the need of lime on many crops is not great.

Mr. Insley will cut from 1,800 to 2,200 bunches of asparagus per acre as compared with an average of 1,000 to 1,200 bunches cut on farms around him; 500 baskets of tomatoes per acre, whereas the county average is 200 baskets; 400 bushels of sweet potatoes per acre as compared with from 200 to 250 bushels; 3,500 quarts of raspberries and a like number of blackberries are 1,500 quarts better than the average other growers get per acre. All produce is sold on the farm to buyers who come from Philadelphia, Baltimore, Washington, New York, and even as far away as Boston.

Because of superior quality of product, Mr. Insley secured an average of 40 cents per quart for raspberries, although he did get as high as 40 cents per pint for many crates; 30 cents per basket for tomatoes (these were used at the canning house of which he is part owner); for sweet potatoes $1.25 per bushel, and for asparagus $4.25 per crate.

Early in the season these prices were topped in most every case, but the above indicates the average during the season.

Potash *and* Potatoes

By Henry T. Maddux

Atlanta, Georgia

TWO series of potash demonstrations conducted this year on the farm of Mr. J. G. Padrick, Tifton, Georgia, under the supervision of Mr. Otis Woodard, horticulturist of the Georgia Coastal Plain Experiment Station, indicate that sweet potatoes need large amounts of potash.

The farmers around Tifton and throughout south Georgia have been using an 8-4-4 or an 8-4-6 fertilizer for sweet potatoes and, in some instances, a 9-3-3.

In the first series of the demonstrations the yield of No. 1 sweet potatoes was at the rate of 2,980 pounds per acre where 1,000 pounds of an 8-4-4 fertilizer were used. Where 1,000 pounds of an 8-4-9 fertilizer were used, the yield of No. 1 potatoes was at the rate of 4,116.8 pounds per acre. The increase in yield was 38 per cent. In the second series the yield of No. 1 sweet potatoes was at the rate of 2,604.5 pounds per acre where 1,000 pounds of an 8-4-4 fertilizer were used and 3,283.5 pounds where the same application of an 8-4-9 was applied, an increase in yield of 26 per cent.

Both demonstrations were conducted in the same manner. Porto Rico sweet potatoes were planted on March 25 with an 8-4-4 fertilizer at the rate of 1,000 pounds per acre on all plats. In both series muriate of potash was applied as a top-dressing to alternate checks at the first plowing at the rate of 100 pounds per acre. This gave an 8-4-4 on the check plats and an equivalent amount of an 8-4-9 on the potash plats. Crops from both series were harvested and graded on July 25.

The soil of the first series was a Tifton sandy loam at plat No. 1 with a gradual gradation to a Norfolk sandy loam at plat No. 7. The soil of the second series was a Norfolk sand. With a rainy season and a leachy soil, it is probable that not enough nitrogen was retained in the second series for potash to demonstrate its full value.

Detailed figures of both series of demonstrations follow:

FIRST SERIES

Yield Expressed in Pounds Per Plat.
.15 Acre Plats

8-4-4	*Total*	*No. 1s*	*No. 2s*	8-4-4 & 100 *lbs. Muriate of Potash*			*per Acre*
1	563.0	513.0	50.0	1	732.1	680.1	52.0
2	496.5	451.5	45.0	2	659.5	606.2	53.3
3	497.0	460.0	37.0	3	641.2	590.4	50.8
4	413.1	378.1	35.0	4	668.8	620.5	48.3
5	541.1	488.3	52.8	5	777.1	716.1	61.0
6	493.0	440.5	52.5	6	657.1	589.1	68.0
7	453.0	397.6	55.4	7	572.3	520.3	52.0
Totals	3,456.7	3,129.0	327.7	Totals	4,708.1	4,322.7	385.4

SECOND SERIES

Yield Expressed in Pounds per Plat.
.10 Acre Plats.

8-4-4	*Total*	*No. 1s*	*No. 2s*	8-4-4 & 100 *lbs. Muriate of Potash*			*per Acre*
1	329.1	294.1	35.0	1	389.6	347.6	42.0
2	273.8	238.6	35.2	2	327.5	296.7	30.8
3	302.9	255.5	47.4	3	403.2	363.8	39.4
4	301.6	253.6	48.0	4	343.8	305.3	38.5
Totals	1,207.4	1,041.8	165.6	Totals	1,464.1	1,313.4	150.7

Good Farming

By Earl Kilpatrick

Marianna, Arkansas

SEVEN years ago L. M. Brilbey bought for $3,000, mostly credit, a 35-acre farm near Imboden, Arkansas. Two years ago he bought an additional farm paying $125 per acre for 30 acres; $3,000 worth of buildings have been built and paid for during the seven years.

Although the soil is naturally somewhat thin, it has been brought to a high state of fertility by proper terracing, crop rotation, and fertilization.

About five acres of sweet potatoes are grown each season. Most of the potatoes are sold locally and in the adjoining towns. He sold $1,450 worth last season.

Potatoes are followed by wheat and very often clover. His average yield has been 200 bushels of potatoes per acre.

He began using commercial fertilizer last season on three acres; 200 pounds of nitrate soda, 400 pounds of 16 per cent acid phosphate, and 100 pounds of muriate of potash to the acre. This plot made 1,080 bushels, or a rate of 360 bushels of potatoes per acre.

In addition to his farm crops, Mr. Brilbey specializes in white leghorns, selling eggs for hatching purposes and baby chicks. He grows the feed for his work animals, has his own milk, and sells a little surplus cream. A good garden helps keep down grocer bills and one-quarter acre of strawberries netted $150 last season.

Cotton Linters

(*From Page* 14)

various qualities, and disputes and controversies arose. Moreover, when the war was over, the War Department had on hand a great confusion of qualities of linters in enormous quantities. At the request of the War Department, the U. S. Department of Agriculture worked out four tentative grades for these linters, but after this surplus was disposed of, the interest in grades for linters ceased.

Three years ago at the instance of the Interstate Cottonseed Crushers' Association the question of standardized grades was again given study by the Department of Agriculture. Since that time, work toward developing and perfecting a new set of standardized grades has progressed steadily. Now under the authority of the Cotton Standards Act, the Secretary of Agriculture has formally promulgated the official standards of the United States for American cotton linters. These consist of seven grades represented by 12 samples each and an eighth or descriptive grade which covers the form of linters known as Hull Fiber.

Industries Cooperate

In this work the Department had the continual assistance of leading representatives of the linter industries including a committee appointed for the purpose by the Interstate Cotton Seed Crushers' Association, a representative of the Better Bedding Alliance of America, and a representative of the American Cotton Linters Association.

The linter crop is handled in practically the same way as cotton. The baling is done in the same way and the size of a bale of linters is similar to that of a bale of cotton, for in almost all cases linters are baled in press boxes much like those used for cotton. Linters can be steam compressed, as cotton is, without injury to the fiber. Bales of linters weigh about 475 to 650 pounds each, but the average weight is about 500 pounds to the bale. The crop is marketed through channels that are somewhat similar to the marketing channels for cotton. Many firms deal exclusively in linters but some cotton dealers handle linters as well as the regular cottons.

The linter crop is almost exclusively an American crop, for the other cotton growing countries have not yet gone into the production of linters to any considerable extent. But the distribution of the crop is effected in Europe as well as in America, and the Bureau of the Census supplies monthly reports on our export of linters. Exports have gone beyond 600,000 bales during some years.

Soil Fertility for Business Reasons

(*From Page* 21)

of the men at the experiment station, or the advisers of the extension service, with which Mr. Poirot is always in close contact. His prolificacy of ideas in no way runs away with good judgment or his willingness to follow good advice.

These are some of the assets in the manager in addition to the farm practices that have done much to give to the Poirot Farms the attention of the farming public they justly receive in Lawrence county of Southwest Missouri.

"Extras" *for* Farm Hands

By Solon R. Barber

U. S. Department of Agriculture

CITY workers and industrial workers who know nothing about the "real" wages of farm help are apt to permit themselves the luxury of a snicker at what appears to them to be the pitifully low level of farm wages. They read, for instance, that "farm labor supply and demand are in close balance this year (1927), the supply for the United States as a whole being 100.4 per cent of the demand" whereas farm wages in the United States average $35.59 per month with board, and $49.54 without board. Industrial workers know that this wage scale (which, by the way, is a pretty fair average for long-time periods) is much lower than their own. Yet there seems to be plenty of farm hands ready to work for such wages.

As a matter of fact, the monetary wage does not represent at all the "real" wage of farm hands. Numerous "extras," the number and character of which depend on the section of the country and the liberality of the employer, go with the monthly pay envelope and contribute to the willingness of farm hands to accept a wage lower than their city cousins receive.

Says J. C. Folsom of the United States Department of Agriculture:

"The majority of farm operators give their men hired for the season various privileges on the farm or allowances of farm products in addition to their wages. Some of these perquisites have been customary for years and are given and taken as a matter of course. Others are so new that frequently the farm operator feels they have been forced upon him—that he had to give in or lose a good farm hand."

Married men get more of these perquisites than single men. Some farmers allow more than others. Farmers in certain regions are more liberal than those in other sections. But regardless of the number and character of perquisites granted farm hands, they all cost the farmer who hires the help a pretty penny and are worth consideration in a farm journal.

Mr. Folsom says that few farmers give their men cash wages without "extras" of some kind. Board, lodging, house rent, fuel, milk, meat, vegetables, fruit, a chance to keep livestock of their own, feed or pasture for that stock, and the use of the employer's tools, horses, mules, or automotive equipment are the perquisites ordinarily allowed hired men by their farmer-employers. Garage space is a somewhat less common one. Some operators even allow their hands the limited use of their own automobiles, if they own them. A study made by the Department of Agriculture indicates that the "total farm value of the perquisites given each class of men (married and single) is nearly the same; for single men, $30; for married men, $31 per month. The single men usually get their board and lodging on the farm together with the use of their employer's horses and mules and vehicles, and garage space for their car. Of course the wages are less when the hands receive board and lodging. Not many married men are given board, "but the majority receive the use of a house or cabin,

and some fuel," the study says. In addition, they receive many other "extras" such as fuel, milk, meat, and one or more of the others listed above.

Board and lodging are the "extras" most costly to the farm owners who give them. "Board alone averaged over twice the value of any other perquisite reported," the study states. "The separate value of the more numerous perquisites given married men averaged lower; for instance, house rent, when given, $9; wood or coal, $4; dairy and poultry products, $10; meats, $5; feed for livestock the man was allowed to keep, $6. Few men get more than a few of these perquisites."

The "real" wage of farm hands thus becomes much higher than the monetary quotations would indicate; from $65 to $75 per month. Furthermore, if the hired man had to pay average city prices for the "extras" he gets on the farm, he would frequently have to pay two or three times their farm values for them. Rent, fuel, light, in the city cost more than their equivalents on the farm, while if he had to buy milk, potatoes, meat, etc., at city prices the farm hand would pay much more than their quoted farm values and probably not use nearly as large a quantity of these necessities. The city worker has little opportunity, as a rule, to keep a garden, poultry, a cow. He must buy vegetables, eggs, and milk at city prices. Mr. Folsom says that "the average married man's perquisites, worth about $30 per month, on the farm would probably cost him nearly twice as much if paid for in the city."

It is true that these "extras" cost the farmer himself very little in actual cash in many instances. Their value to the operator is little as compared with their value to the hired help. It is not often that the farmer is put to any inconvenience by allowing the hired hand garden or garage space, or to any particular expense for his help's use of farm tools or work stock. But the value in good will created between the workers and the operators is not so small. Good employers build up loyalty and affection in their hired help by allowing them privileges.

"Many farmers needing a good class of steady hired help should consider giving additional perquisites possible on their farms, especially those which cost little but mean much to the laborers," Mr. Folsom says.

In other words, giving these "little extras" is an excellent and practical way to attract and hold the best farm hands.

Room for Mushrooms

Cottonseed meal mixed with compost gives promise of being a means of utilizing the space under greenhouse benches for the profitable growing of mushrooms, according to F. C. Stewart, the mushroom specialist at the New York Agricultural Experiment Station, who has been carrying on a series of compost tests.

"The striking results obtained in these experiments," said Mr. Stewart, "indicate that cottonseed meal may have an important place in mushroom culture. Success with mushrooms is uncertain, particularly among amateur growers. It is quite possible that many failures are due to defects in the compost which might be remedied by the use of cottonseed meal. The material is inexpensive and easily applied. In our experiments it has been mixed with the manure at the beginning of fermentation in the proportion of about 69 pounds to 100 cubic feet of unfermented manure, or from six-tenths to eight-ninths of a pound per cubic foot of compost ready for the beds. It remains to be determined what quantity is best to use."

The Fertilizer Outlook

(*From Page* 13)

farm price of cotton was 21 cents. In December, 1926, the farm price was only 10 cents. The prospective yield in 1927 is only about 18 per cent less than last year. In addition to the farm price of cotton and cotton yield, other factors that influence consumption in the eight southern states are: cotton acreage, the fertilizer price index, tobacco price, and relative agricultural prices. Changes in these six factors account, under present conditions, for a large part of the variations in fertilizer tonnage sold each year in these eight states.

Under present conditions it is the composite effect of these six factors that decides the tonnage that will be sold in the following year. The composite effect of these factors now, October, 1927, indicate that the 1928 fertilizer consumption in these eight states will be considerably higher than in 1927. It will be another month however before a percentage increase can be estimated. This does not mean that the prospective increase will be uniform in each state. There will be individual variations. Some states will increase more and others less. The present conditions of the six factors mentioned indicate that South Carolina, Alabama, and Louisiana will show the highest increase of fertilizer consumption, and North Carolina, Georgia, Mississippi, Arkansas, and Texas an increase, but less than the first group.

The outlook in certain tobacco areas in general is not as favorable for 1928, as it was for 1927. The price of potatoes is less than it was a year ago. Thus, while the outlook is for an increase in fertilizer consumption in the cotton belt, this regional increase is partially offset by probable declines in some tobacco and potato sections of the United States.

How much increase actually occurs, also depends a great deal on the amount of work that is done to help farmers make profitable investments in fertilizers. Certainly, the conditions are better on the whole than they were last year. The most should be made of the opportunity.

Reviews

(*From Page* 46)

cussed in bulletin: "Large-Scale Cotton Production in Texas," Agr. Exp. Sta., College Station, Tex., Bul. 362, July, 1927, L. P. Gabbard, F. R. Jones.

The data presented in bulletin, "Cost of Feeding the Nebraska Farm Family," Agr. Exp. Sta., Lincoln, Neb., Bul. 219, June, 1927, J. O. Rankin, were obtained from a survey of 342 Nebraska farms. The average value of food consumed per family was $735. An average of $230 per family was spent at stores for food. The difference, $505, was the estimated value of farm grown food consumed by the family.

The average consumption of food per capita (adult equivalent) was about 2,500 pounds. This is almost three times as much as the urban consumption. There is, however, a considerable difference in the type of food consumed on farms and in urban centers.

The rapid rise in the price and purchasing power of California grapes during the seven-year period, 1914-1920, stimulated planting. The increased production from these vineyards has been accompanied by a general decline in the price of grapes. The primary factor affecting prices is the supply, thus the immediate outlook is

not very favorable. An analysis of shipments by regions and seasons is also given in "Economic Status of the Grape Industry," Agr. Exp. Sta., Berkeley, Cal., Bul. 429, June, 1927, S. W. Shear, H. F. Gould.

"Larger Markets for Montana Wheat," Agr. Exp. Sta., Bozeman, Mont. Cir. 135, August, 1927, E. J. Bell, Jr.

Diseases

North Carolina Ext. Cir. 166, "The Control of Covered Smut of Wheat with Copper Carbonate Dust," goes into detail with instructions and pictures on a practical method of saving Southern wheat growers hundreds of dollars in losses. G. W. Fant, the author, states that from 10 to 40 per cent lost in the wheat crop from smut in individual fields is not unusual in North Carolina.

"Spraying for the Control of Fig Rust," Agr. Exp. Sta., College Station, Texas, Cir. 47, July, 1927, W. B. Lanham, R. H. Wyche, R. H. Stansel.

Insects

Of wide interest will be "Further Experiments with Poisoned Baits for Grasshoppers," Nebraska College of Agriculture, Res. Bul. 41, written by N. S. Swenk. Grasshoppers take a large toll in forage crops all over the United States each year. Many sections undoubtedly can use to advantage the information contained in this bulletin.

"The Tobacco Budworm and its Control in the Georgia and Florida Tobacco-Growing Region," U. S. D. A., Washington, D. C., Farmers' Bul. 1531, A. C. Morgan and F. S. Chamberlin.

Postponing Hunger

(*From Page* 24)

varieties and is resistant to the forms of leaf rust and stem rust which occur in the hard, red winter-wheat district. It is winter resistant and has outyielded the most commonly grown commercial varieties by four bushels per acre based on a 10-year average. About 2,000,000 acres of land were seeded to this variety in 1921. If the 4-bushel increase was maintained, the 8,000,000 additional bushels of wheat produced would be capable of furnishing the wheat bread ration for 1,400,000 people for a period of one year.

It is possible to continue, almost without end, giving examples showing how through plant improvement our food supply can be increased without increasing our cultivated acreage. One is safe in predicting that plant improvement achievements in the future will far surpass those of the past. If this prediction proves true, it is difficult to say how long it will be before our population overtakes our food supply.

If agricultural science, while yet in its infancy, has obtained such notable results, can we not expect infinitely more of those who follow us, profiting, as they must surely do, by their discoveries as well as by the accumulated discoveries of the past? All of us are interested in the future as it affects our population and food supply. It presents a complex problem. Much remains to be done which will affect the future. We have barely started to utilize the possibilities of plant and animal improvement. As the demands of necessity for more food increase, man's efforts will increase in an attempt to meet them. Much which now seems impossible will be made possible through the application of science to agriculture.

"I think there is company downstairs."

"How do you know?"

"I just heard Mamma laugh at one of Papa's jokes."

Why Burn Corn-stalks

(*From Page 26*)

for both fertility and better aeration of the soil. He bemoans the fact that while a good many farmers buy stalk cutters, most of them neglect to use them, and so many good stalk cutters rust out instead of wear out.

Corn-stalks are something to wrestle with if they are not properly handled, Akerlund admits, but he says his plan for cutting them up has everything else beaten.

He saw the disuse of the single-row stalk cutters that brought low prices at public sales. He went about it and bought three of these units. Then he assembled them into a big wooden frame so they would cover three rows at a time, and to this he hitched his farm tractor. With such a plan, stalk cutting in the spring is a short job, and it can be done before other work is due. Cutting the stalks into the short lengths puts them into shape so that they give little or no trouble for the other implements to follow.

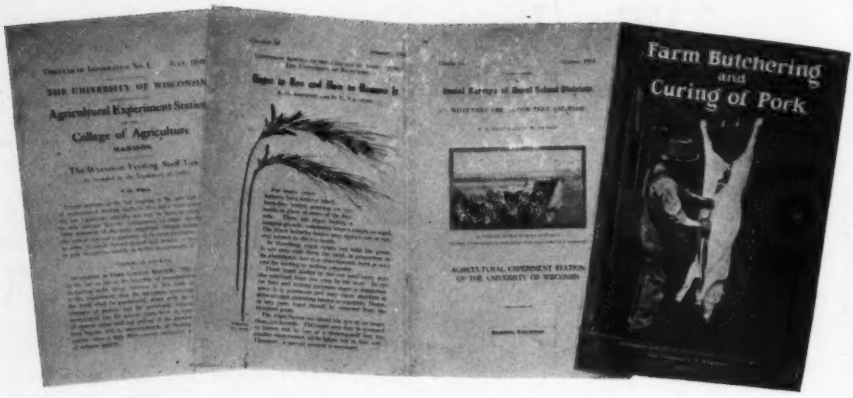
It may not be really a shame to see the stalks burning all over the country every year, for possibly the farmers who burn them can show good reason for their acts. Possibly their land is too rich as it is; possibly they need to have its face washed a little more than stalk-covered land would permit; or maybe they require a few grooves down the hillsides to break the monotony of the rounded contour. It is a fact that corn-stalks, too many of them in the soil in a droughty year, aggravate the drought, because they do liberate a little moisture. But that only applies in an occasional year, and then mainly toward the arid districts farther west. There is no more excuse for firing the corn-stalks in the field than there is for setting fire to the straw stack. Both have value.

There will be time enough to burn stalks after the full advent of the corn borer, but while yet the fields are free from that pest, let's keep that other pest, the fire, entirely away, and prepare stalks in a modern way for the best burying possible.

Kanred Wheat Makes Record

The Minister of Agriculture of Argentina, one-time ambassador to the United States, has long taken a great interest in agricultural developments in this country and has always been quick to adopt anything that might benefit his own country. For some time he has been watching the development of Kanred wheat and last year he secured 200 tons of seed of this new variety which was developed at the Kansas Agricultural Experiment Station from seed brought from Russia in 1900 by the U. S. Department of Agriculture. As a result of this experiment in Argentina, the Kanred wheat outyielded the varieties commonly grown there by from 50 to 100 per cent. The present Argentine ambassador at Washington, Senor Honorio Pueyrredon, reported to the Department of Agriculture that from 960 acres sown by one farm corporation an average yield of 19.4 bushels per acre was obtained and in some cases the yield was even higher.

When sown under the same conditions as one of the leading varieties of Argentina, a variety which obtained a medal at an Argentine exposition last year, the Kanred yielded 90 per cent more.



The Bulletin

(*From Page 9*)

tion. If it is to be given a welcome it, too, must possess the features that will beckon the farm family inside its covers. Though the name of the institution carries prestige and authority, these alone are not sufficient to guarantee the bulletin a thoughtful reading. Because of a realization of this, from many agricultural colleges the farm bulletins and circulars now come as works of art.

Unlike their predecessors the modern agricultural bulletin and circular strive to make a distinct appeal to the farm folk. When illustrations are used they are chosen for their ability to tell at least part of the story related on the inner pages. The title is as short as is consistent with a clear understanding of the subject, and it is given the most prominent display. Subordinated to it is the name of the institution publishing it, the number of the publication, and the date. The author's name has either disappeared from the front page, and is now to be found on the inside, or else it is set in smaller type faces on the cover.

Big Brothers

(*From Page 25*)

boy or girl who belonged to a 4-H Club. Since this 4-H Club member was doing some definite piece of work, such as the growing of a pig, a calf, or some special canning and sewing projects, the Big Brother was given many opportunities to encourage his little brother or sister.

Here are a few examples of what actually happened in 15 rural communities. A Big Brother, upon making a personal visit, found that his 4-H friend was about to give up the idea of going to high school. After talking things over in a heart to heart fashion, the boy was finally persuaded to enter school this fall. The Big Brother has made five different visits to the boy's home, proving that he is a real Kiwanian.

Another Big Brother and his family spent a whole Sabbath day at the 4-H boy's home. The result has been a very close friendship. So pleased was the father of the boy, that he brought his two young sons to the Kiwanian's place of business the following week. This same Kiwanian

further spread his influence by giving his country friend some used magazines and books, which were not only read by the boy and his parents, but by several other families in the community. It is no exaggeration to say that Kiwanis has become a byword in this community. Is not this kind of contact worth while?

Two years ago a red-headed 4-H girl invited her Big Brother to attend a picnic party. Our Kiwanian became so interested in the little girl that he offered to give her financial aid towards her schooling. More than that, he offered her a position in his place of business when she should have completed her schooling. Our little sister accepted the kind offer and is making every effort to fit herself for a useful position in life.

In many community meetings our Kiwanians played an important part in the program. President Sisler was the principal speaker at the annual meeting of the Farm Bureau. There were many other Kiwanians present. The Kiwanis Chorus rendered a fine musical program at a recent meeting in a country church. The entire Kiwanis Club with their families attended the county picnic at the County 4-H Camp.

Is there any better way to build the future generation of the city, or to bring about a closer relation between the country community and the city, than the plan adopted by the Huntington Kiwanis Club? If there is any civic club that wants to render some real service, we heartily recommend this project.

Hungry Soils

(*From Page* 18)

experiment fields, etc.

Mr. Amundson, fully appreciating the importance of the soil problems of his county says,

"It isn't hard to get farmers to adopt sound practices. If the idea is right it is soon recognized. You can't fool farmers or get them to adopt impractical schemes for doing their work. We must reduce our recommendations to the practical things which the average farmer can follow."

But before we can teach farmers, we must know ourselves. A knowledge of the fertility requirements of our soils is prerequisite to everything else. Some soils need phosphates, some need potash, others combinations of these elements. In fact there are some soils which need only good management and proper systems of cropping.

If Mr. Amundson had taken the blanket recommendations of the Soil Department of the College, he would have been recommending lime and phosphate where potash was the chief limiting element. He would have failed in his demonstrations and farmers would have lost faith in their county agent.

Our lime and phosphate campaigns have resulted in much good in Wisconsin, yet there have been counties and localities where neither lime nor phosphates were needed, and county agents should be informed as to the fertility requirements of the soils of their county in order to get their farmers started in right practices in the use of fertilizers. Campaigns for the use of lime and the use of phosphates where these elements are needed chiefly in a given locality are valuable, but it would be better to put on campaigns in which soil fertility is stressed rather than the need for any particular element, since there is danger of getting farmers started in the wrong practice in the use of fertilizers.

Soil fertility campaigns should always be a part of the program of the county agent, but county agents should know their soils.

Leading Farm Folks

(*From Page* 12)

credit. Perhaps his attitude is that of a real leader of farm folks. Truly he has had wonderful help from local leaders, for during the year it is officially recorded that 432 men and women gave generously of their time to act as chairmen of committees or in other types of active local leadership.

Benson has been the inspiration of his leaders and the balance wheel that has kept the work going along constructive lines. All this he has done for the sake of the ideal, "That farm life may be so changed that there shall be a happy and contented family on every farm in Knox county."

Controlling Loose Smut

(*From Page* 27)

a thin layer and stirred several times a day with a garden rake or similar tool, it dries very quickly. However, the grain may be planted immediately after treating provided it is well drained and the drill is set to allow for swelling.

Plant pathologists tell us there is no other effective remedy for loose smut in wheat. In barley it may be partially controlled by the formaldehyde treatment, but the experience of Virginia growers of certified grain has been that all smuts—loose, covered, and stinking—and perhaps some other diseases in both wheat and barley, are completely controlled by the hot water method.

In five years' work with smut control in Botetourt county, results have been almost perfect. No greater infection than a *trace* has been found in any of the treated fields, and there is good reason to believe that this slight infection was due to top-dressing with manure in which infected straw had been used as bedding.

One lot of barley treated October 2, 1924, came from a field in which there was 14 per cent infection and for this reason could not be certified, came through the following spring without a trace of smut anywhere in the field. Another field sowed from the same lot but untreated showed 11 per cent infection.

It is estimated that the average annual loss in Virginia from loose smut is three per cent or about 300,000 bushels, yet some farmers say that smutty heads are a sign of a good crop.

Alabama

(*From Page* 30)

clover and crimson clover. More recently Monantha vetch has been introduced by this station, and it promises to replace hairy vetch because it matures earlier and it is a seed producer.

However, it, too, was introduced into the state by the experiment station. The Austrian winter pea is another leader.

Not only have these been introduced, but facts about their growth have been worked out and promulgated.

Due to this winter legume work Alabama farmers know how to add to the soil all the nitrogen they need, and along with it a large tonnage of humus. They know how to enrich their land during the winter

without interfering with the production of summer crops.

With a crop of winter legume they can add 50 pounds to 200 pounds of organic nitrogen per acre in one season. The minimum amount is more than the average farmer applies when he is buying commercial nitrogen. When all farmers in Alabama grow these winter legumes they will save approximately 50 per cent of the annual fertilizer bill of $15,000,000 to $20,000,000. Therefore, this work alone is leading to a saving of millions of dollars annually.

Another Achievement

Another major achievement of the Alabama station was the development of better varieties of cotton. Cook 307, Cook 1010, and Cook 588 are three of the leading varieties of Alabama cotton. They were developed at Auburn. Cook 307 is a wilt-resistant cotton which with Covington-Toole, another wilt-resistant variety but not developed at Auburn, constitutes most of the cotton produced on wilt-infected land in Alabama. Before these wilt-resistant varieties were developed, cotton production on large areas of Alabama was not profitable due to wilt which was very destructive.

Cook 1010 and Cook 588 are leading varieties in other sections.

In developing and establishing good varieties, rag-tag varieties have been eliminated. Cook and Cleveland strains of cotton are now favorites throughout the state. Therefore, Alabama cotton is being standardized due to the work of the experiment station.

Likewise, variety tests of corn have revealed the best varieties to plant. The station has not developed a variety of corn, but merely tested the different known varieties. Weekley, Whatley, and Hastings are the three leaders.

The station is now turning its attention to machinery and power for Alabama farmers. The director and his staff realize that Alabama farmers are facing a huge problem in cotton production.

Not many years ago the West sent to the East the boll weevil which revolutionized farming in Alabama and other states east of the Mississippi River. More recently Texas and Oklahoma have sent to them a challenge to either make cotton cheap, reduce their standard of living, or quit making cotton. This problem is being tackled from a power and machinery standpoint in addition to information already worked out on fertilizer, variety, and production methods.

Poultry work is becoming a major project because of the growing importance of poultry. Here the station is making another major contribution to Alabama agriculture.

The work of the Alabama station on insects and also on animal feeding and breeding as well as vegetables and fruits has been done along lines similar to other stations. Wherever a problem has arisen in Alabama agriculture, the experiment station has undertaken to solve it. In most cases it has succeeded, and this success has returned to the state and the nation a hundredfold dividend on money spent in research.

Potash Salts

Muriate of Potash.....80-85% KCl
Sulphate of Potash.....90-95% K_2SO_4
Sulphate of Potash-Magnesia.....48-53% K_2SO_4
Manure Salts.....30% K_2O
Manure Salts.....20% K_2O
Kainit.....14% K_2O
Kainit.....12.4% K_2O

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Where Home Dollars Do Home Work

(*From Page 8*)

ized by the bank among the school children of the country districts. Officers of the bank give personal instruction in the processes of banking, so that banking may be better understood and some of the diffidence in using the bank removed.

Finding that it paid to help the farmer, the bank did not stop with the purchase of cattle. It soon began lending money to the farmers with which to improve their farms and farm buildings. Money that was formerly sent to the city for investment is now kept at home and put to doing home work. Instead of developing industries that would eventually draw many of the young people away from the farms it now goes to develop the farms and to make farm life more interesting and profitable. This has done much to encourage the boys and girls to remain at home.

Prosperity Reflected

The prosperity of the whole community is to be found reflected in the improvement of the banks. The profits that have come to the farmers on account of increased and improved farm business are deposited in the local banks and again lent out to improve other farms and create new wealth. And like the rolling snowball it becomes greater with each revolution.

Let's see what the effect on one of the banks has been.

In October, 1916, when the first

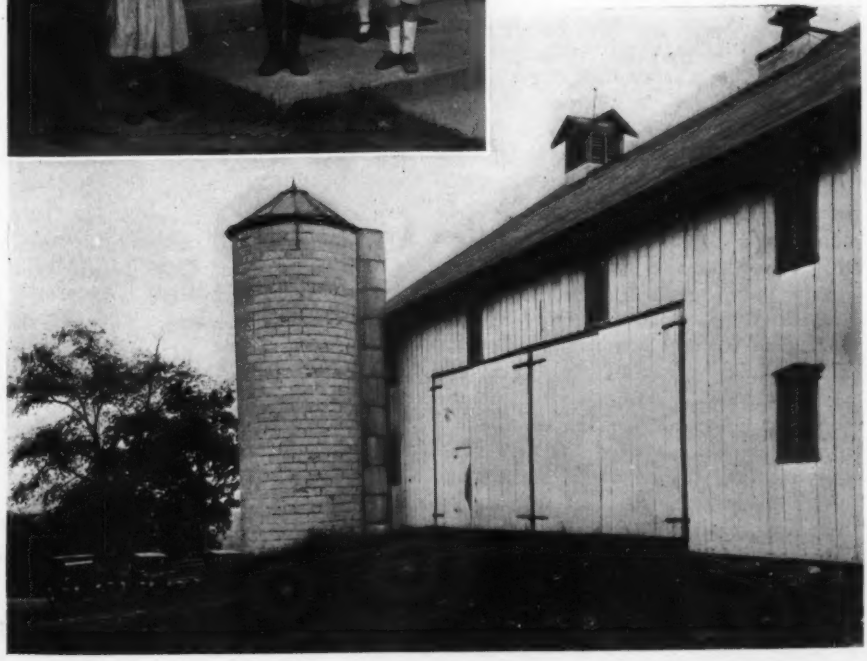
carload of cattle was brought to Grove City the bank's deposits were $894.445.46. On January 1, 1918, — 15 months later — they totaled $1,325,308.28, a gain of $430,862.82.

During the same period the number of depositors increased from 4,614 to 5,343. The radius of bank patrons widened from five miles to ten. In this short time, 146 farmers bought, through the bank, purebred cattle.

A conservative estimate of a year's gain in country deposits, due to the bank's aggressive program, is $150,000, or a third of its total increase. Of the total deposits of about $4,000,000 in both the Grove City banks close to half represents farmers' accounts.

Increased financial prosperity, however, is only a small part of the gain that has come to the community. Better schools, better churches, better homes, and better social conditions generally are coming as a result. The people have learned to work together with a community spirit. The gulf between the town business man and the farmer has been bridged.

There's a lesson in the Grove City project for thousands of small towns all over the United States. It may not be dairying but some other latent possibility that only awaits the vision of the community — and the will to bring prosperity home.



***Left:** Some of the young consumers of the creamery's products. Below: Ear-marks of the practice of better farming.*

Gratitude

(*From Page* 4)

at the receiving end might make all concerned more satisfied and grateful.

Everything is planned to save steps and cater to comfort. Children are reared in a radio-motor mania, develop "nerves" and are unbearably peevish if the funny sheet is missing on Sundays.

In public life it is the same. We elect a hero to office amid acclaim, and then proceed to tear his reputation to pieces in a fortnight. Columbus was not the only public man to feel the pangs of an ungrateful world. We have had our Deweys and Wilsons, who felt the sudden and unreasonable backwash of public opinion.

It is to be hoped that Lindbergh will never even so slightly let himself in for possible criticism for an overt act, for if he does the ravens of rapacity will croak so loud that the glory of May, 1927, will be tarnished.

The man who said "the bigger they are the harder they fall" was well up on the high mortality rate of human gratitude.

YET we are not so much a devotee of Menckenism that we refuse to see that there are extenuating circumstances — conditions nowadays that choke out the natural growth of gratitude.

Lack of gratitude exists because of ignorance of our benefactors due to the bewildering rapidity of invention and discovery.

A man named Jenkins of Washington, D. C., invented the first motion picture reel. Perhaps some may not consider him as a serious candidate for gratitude (considering Fatty Swashbuckle, *et al*)—but at any rate, you'll agree that Jenkins is not found on the household shrine beside Babe Ruth, Henry Ford, and the Smith Bros. (Trade and Mark.)

Since his day, have come others who have perfected the projection lenses, improved the screen, "de-flickkerized" (and perhaps) devitalized the silent drama, improved the technic of love making and pie throwing—and in generous but forgotten measure rendered yeoman service to us all.

Every school kid knows that the Wrights of Dayton were the fathers of aviation in its crudest forms; but who can name the men who are improving airplane engine lubrication, compass control, and wireless direction guides as the era of aviation rapidly unfolds?

In plainer terms, I bet you can name the substantial grub you found in your old battered school time dinner-pail, but have forgotten the multitude of courses you consumed or refused at the Rotary banquet last week.

"Too much is enough," is a maxim that can be put forward to excuse ourselves for our ignorance and our confusion, with its inevitable ingratitude. We are simply moving too fast to count the milestones or praise those who erected them.

GRATITUDE in this age is a sluggard. It takes a big noise to wake her up. Our wonder and pleasure are chiefly aroused by the spectacular, the bizarre, the lurid, the thrillers.

The hum-drum hero is out of luck. Gratitude is measured by the headlines. The reporter often dictates when we shall be grateful and glowing to some individual for performing a public prank of prowess. Likewise, the newspapers help us to select and dispense our charity, so that we cannot even be grateful to ourselves without outside interference.

At the time when the chewing gum

victims provided a purse for the Channel Swim, and the telegraph news service of the continent was listening for the first splash of the oily victor; at the time when over-seas flights were the top headliners of the international press—two heroes of great valor died unnoticed, unmedaled, and unsung.

Down in Alabama a soldier of the Spanish-American war died in poverty, and he was the man who sacrificed his body to the research chemists to control yellow fever in Cuba. Yes, I am also lacking in something, for I have forgotten his name. But the fellow who won the spearmint race was young Young.

Last May during the airplane furore a single intrepid river man in Mississippi saved more than three hundred souls from certain death because he knew the vagaries of the channel and the best way to get them provisions.

He got a paragraph, but Congress has not struck off any medals for him that we know about.

The comforting thing about such cases is that he-men of that kind are not usually looking for plaudits, being content to take their thanks in the tearful admiration of the home folks.

Then of course, in later life he will have something nice written to engrave on his tombstone. That all helps!

IF anything at all definitely shows how bad off we are for supplies of natural gratitude, it is the w. k. sad case of the embattled farmer and his kindred. Tag along and I will state the case. Ever since the Pilgrim Fathers celebrated the first Thanksgiving on a feast of clams and parched corn, holed in against the irritating Indians, agriculture has until recently taken the good with the evil in a stoic manner quite creditable.

Inured to hardship and the wind through the cabin chinks, used to toil and disappointment, long treks to a small market, and getting few free favors, the farmers who made America were people of neighborly gratitude. They appreciated what they got and surrounded their occupation with an aura of blessed bucolic content.

But of late we have seen some leaders arise with the penchant for seeing how many things farmers could rake up to growl and be ungrateful over. They are bound to knock all that sentiment of gratitude into a cocked hat, for they say farmers are entitled to become as complex, as confused and as bitterly ungrateful as anybody else. This they must and will get through a higher standard of living in ever-increasing ratio, adding to the misery and piling up gallons of gall and cords of worm wood.

These spokesmen are teaching ingratitude to government for farm legislation or the lack of it, yelling against college and experiment farms, and are belittling bulletins and demonstrations.

A mean man always turns first on the friend who has placed him most in debt. The false prophet always preaches hate and strife. Agriculture will never have real satisfaction if it forgets gratitude. So it is with all walks and all callings. Unless a man has a good memory for good deeds done him and bathes his soul sometimes in gratitude, what real satisfaction can he realize at the end of his work?

Even a dog has it.

And at this moment I take occasion to place myself in your deepest gratitude, for this is positively the end of my essay.

HIGH COST OF IGNORANCE

Senior—"What will it cost me to have my car fixed?"

Garageman—"What's the matter with it?"

Senior—"I don't know."

Garageman—"Fifty-two dollars and sixty cents."—*Yale Record.*

A PROSPECT

"Oh, darling," he murmured, "I love you so. Please say you'll be mine. I'm not rich like Percival Brown, and I haven't a car, or a fine mansion, or a well-stocked cellar like Brown; but, darling, I love you better than life itself. I cannot live without you"

Two soft, snowy white arms stole around his neck, and two ruby lips whispered in his ear: "And I love you too, darling; but where is this man Brown?"

Proud Parent (who served)—"What I told you is the story of the World War."

His Son—"But, papa, what did they need the rest of the army for?"—*Answers.*

When you trip, fall forward and get up farther along.

Mistress—"You tore up your references? You silly girl!"

Prospective Maid—"You wouldn't say that if you'd seen them."

Cinderella—"Godmother, must I leave the ball at twelve?"

The Good Fairy—"You'll not go at all, if you don't stop swearing."—*The Enamelist.*

WHERE IT LANDED

Little Boy—"Please, may I have my arrow?"

Lady of the House—"Why, certainly, where did it fall?"

Little Boy—"I think it is stuck in your cat."

STILL BUBBLING?

Little Boy (returning from swim)—"Mother, papa certainly is a good swimmer."

Mother—"Why, sonny, your papa can't swim a stroke."

Little Boy—"Well, anyway, he can stay under water a long time."

THE MODERN BOY

Nurse (to eight-year-old Bobby)—"Would you like me to show you the nice, cute, little baby the stork brought your mother?"

Bobby—"Naw; show me the stork."

That he might patronize the institution of his employment, Sam, the colored janitor of a bank in a northern city, had drawn a check for $350.00 on the colored bank in his home town in Georgia. It had just been returned with a slip attached, "Not cashed for the lack of funds." The cashier, after being assured by Sam that the money had actually been deposited there, wrote a very caustic letter to the cashier of the colored bank. In due time this answer came back, "Wen we sends back a check saying thar ain't no funds, we all don't mean that the customer ain't got no funds; we means we ain't got no funds."

FALSE ECONOMY

Browne—"Did you give your wife that little lecture on economy you talked about?"

Baker—"Yes."

"Any result?"

"Yes—I've got to give up smoking."—*Answers.*

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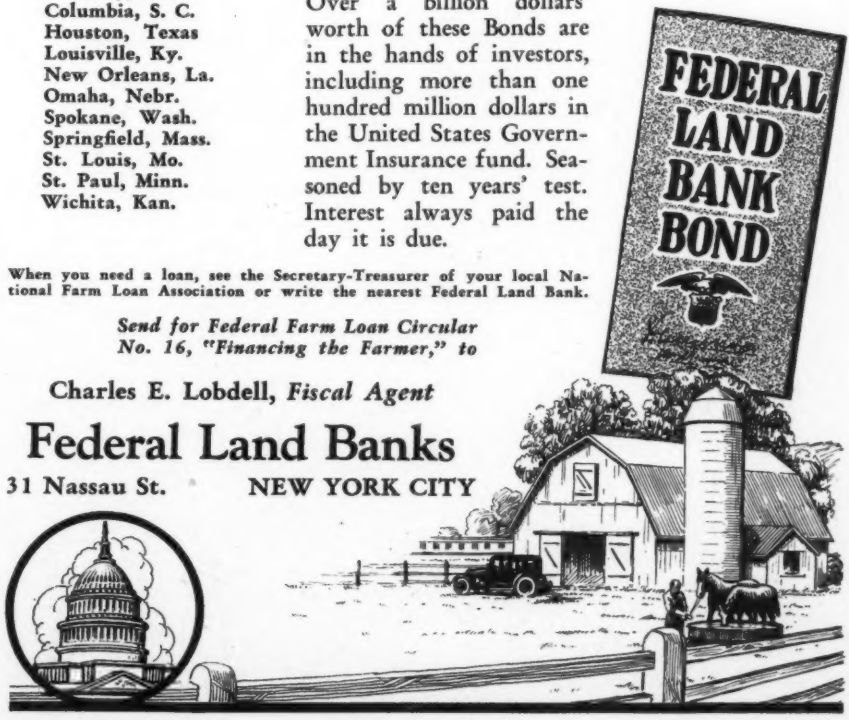

When you need a loan, see the Secretary-Treasurer of your local National Farm Loan Association or write the nearest Federal Land Bank.

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Limit Your Truck Profits

IS YOUR truck farm paying you as much as it can? Is each acre giving the maximum in yield and quality? It is easy to make your farm do its best because most trucking soils, though deficient in plant food, are very efficient in rendering fertilizers available to crops. The grower has it largely in his power to determine crop yields and quality by the amount and kind of fertilizer he applies.

You can easily find by a simple test whether you are getting all the profits you should. Give a few rows a substantial increase in fertilizer over your usual application. Be careful to weigh yields and note marketable quality of these rows at harvest time. See if they stand out.

Sanford, Florida, celery growers have found that increased yield of better quality at a lower cost per crate parallels to an extent the increased use of high analysis fertilizers. Today they lead in intensive fertilization, applying four to five tons per acre on their celery and—the curve of profit is still rising due to bigger acre yields of better celery.

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